ARCHIVES OF OTOLOGY.

HISTORICAL REMARKS UPON THE OPERATION FOR EXPOSING THE TYMPANIC CUPOLA-SPACE [ATTIC] AND THE MASTOID ANTRUM.

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(*With one figure in the text.*)

In the last volume of these Archives (p. 337), Holmes gives a pretty complete sketch of the works relating to the artificial opening of the mastoid process without exposure of the tympanic cavity. His description of the more recent developments in the surgery of the middle ear, however, shows so many deficiencies, that we may perhaps be justified in seeking to make it more complete.[1]

The stimulus impelling us to extend and amplify the operative methods which we had been in the habit of employing upon the basis of Schwartze's publications, must certainly be attributed to Küster, whose procedure was also taken up by v. Bergmann soon after Küster's paper was published.

Küster in his essay upon "The Principles of Treating Suppurations in Cavities with Rigid Walls," etc,[2] expressed his views as follows: "The method of operating proposed by Schwartze, although practised by most otologists, I cannot regard as satisfactory from a surgical point of view"; and again: "A rational surgical procedure must start from the principle of making a wide and thorough opening in the bone, removing everything that is diseased, and exposing the source of suppuration so freely that the pus cannot possibly meet with any obstacle to its exit."

[1] An exhibition of the facts in the case has also been given by Zaufal (*Arch. f. Ohrenheilk*, xxxvii., p. 33.

[2] *Deutsch. med. Wochenschr.*, No. 13, 1889.

With regard to the operative procedures, Küster makes a distinction between the cases in which there is a primary affection of the mastoid process, and in those in which there is a primary suppuration of the middle ear with or without a secondary implication of the bone. In the former case a simple chiselling of the mastoid process is done, and everything that is diseased is removed. In the case of primary suppuration of the tympanic cavity, if syringing and the removal of granulations and of the ossicles do not suffice to produce a cure, "we must decide to do chiselling of the mastoid, and must obviously do it earlier than has hitherto been the practice; and our decision will be accelerated if we all believe, as I certainly do, that the operation is in itself devoid of danger."

"In such cases the difficulty consists in determining the indications for the operation. When is the right time to do it? In my opinion it is at the time when the inflammation is beginning to pass beyond the limits of the tympanic cavity, as shown by the presence of periostitis of the mastoid or of cerebral symptoms—vertigo, headache, and fever."

In such cases Küster has recommended a preliminary thorough-going removal of the posterior wall of the auditory canal as an adjunct to the operation of chiselling the mastoid. "If the ossicles and a part of the drum-membrane are still left, the auditory canal ought to be opened as close to the external aspect of the drum-membrane as possible. Then I usually pass a drain through the auditory canal, one end of it projecting from the wound, the other from the external ear. It is true that in this case, the exposure of the middle ear is but incomplete; nevertheless there are some less severe cases which are frequently cured in this way. But if the tympanic cavity is filled with granulations, and if the drum-membrane and ossicles are in large part or entirely destroyed, I try to get down and into the middle ear, so as to be guided by my eye in removing with the sharp spoon everything that is diseased. Then either a drain is passed through the ear, as in the previous case, or the deep wound in the bone after it has been thoroughly disinfected is tamponed with iodoform gauze. The dressing is changed infrequently, and the routine

use of irrigations appears altogether superfluous, since the suppuration is usually trifling after the operation."

E. v. Bergmann in his monograph, *The Surgical Treatment of Brain Diseases* (2d ed., 1889, p. 95), says: "Certainly in the majority of cases of suppuration from the middle ear, careful syringing through the external auditory canal will accomplish our object—that is, effect a permanent cure. But when a cure is delayed, when the drum-membrane is destroyed and the ossicles have disappeared, and when the suppuration has extended to the mastoid cells and affected the bones themselves, much more may be done than to simply chisel out the mastoid process and to keep on industriously syringing the ear with the modern antiseptic solutions. Our task, then, is to liberate the pus and procure for it a permanent exit. To drain the abscess-cavity and let it alone are the best means for effecting this object. By our injecting and our irrigating, particles of pus—that is to say, phlogogenic substances derived from the focus of suppuration,—may easily be pushed or driven into the non-suppurating, but soft portions of the brain adjoining the latter. The stream of carbolic or boric acid becomes in this way a means of propagating the inflammation. How often have I seen simple wounds of the soft parts, which would certainly have healed beneath a scab if left to themselves, inflame upon the fifth or sixth day, merely because they became the object upon which a physician armed with irrigator or syringe had to expend his energy. In modern otiatrics I have seen a longer and stronger application of the syringe employed than I myself would have dared to undertake in a widely gaping wound in the skin."

On p. 95 he says: "Between the upper wall of the external auditory canal and the lower and lateral border of the middle fossa of the skull, lies a pretty thick layer of bone into which the chisel can penetrate as far as the bony frame of the drum-membrane, without opening the cranial cavity. We can convince ourselves of this fact by making parallel to the base of the skull a saw-cut placed over the external auditory meatus (?). The superior limit is formed by the columnar projection which the obliquely directed root of the

zygomatic process presents above the ear, a projection which extends above the external auditory meatus as far as the external surface of the mastoid process. The external ear is circumscribed by a semilunar incision concentric with the antihelix, and distant 2 *cm* from it, and extending to the outer surface of the outer table of the mastoid. The branches or trunk of the posterior auricular artery, if they happen to be injured, are ligated. Next the periosteum is stripped back superiorly, postero-superiorly, and posteriorly from the border of the external auditory canal, so that the circumference of the latter is everywhere denuded. Then a slender, sharp chisel is introduced directly beneath the ridge upon the root of the zygomatic process, above mentioned and successive laminæ of bone are chiselled off, the chisel at the same time being carried farther and farther back till it reaches the mastoid process, and from this point carried forward again in an oblique direction so as to penetrate the pars tympanica, which forms the posterior wall of the external meatus. The precaution of directing the chisel obliquely and of chipping off the laminæ of bone by prying them up with the instrument introduced flat-wise into the bone, will prevent us from penetrating too deeply and from injuring in any way the facial nerve in the Fallopian canal. By removing in this way the posterior and upper wall of the external meatus, we can form a funnel-shaped hole, into which we can introduce the finger as far as the tympanic cavity, and thus remove from the latter with the sharp spoon the remains of the ossicles, the indurated granulations, and the cheesy and stagnating pus."

Although several objections must be made, both from an anatomical and a pathological standpoint, to the propositions enunciated by these two surgeons, yet their exhortation to liberate pus and procure for it a permanent exit, has impelled otologists to take up anew the question of chiselling the mastoid, and our operative methods have in consequence been thrown into new channels.

It can scarcely be denied that the results were unsatisfactory in many of the mastoid operations as formerly made. The reason for this was that, on the one hand, the morbid

processes in the middle ear and particularly in the attic were not made accessible to treatment, and consequently were not cured, and that, on the other hand, when the opening made in the mastoid closed, the mucous membrane in the interior began to secrete again, and thus the old state of things set in once more, giving rise to chronic suppuration or to the deposition of cheesy or cholesteatomatous masses. There were [quite a number of] cases in which the chiselling had to be done again one or two years after an apparent cure.

The proposal to chisel down through the posterior wall of the auditory canal into the tympanic cavity seemed to me most objectionable, for from the result of my dissections I could not but consider it inapplicable on account of the danger to which it gave rise of injuring the facial nerve and the external semicircular canal.

It cannot be doubted that a considerable number of facial paralyses have been produced as the result of Küster's proposition, and at the International Congress an American colleague said, when he visited me: "I have been only two days in Berlin, and yet I have seen three facial paralyses following the chiselling of the mastoid, although in America I never saw one."

After I had enlarged my collection of horizontal sections through the temporal bone so as to determine by comparison and measurement the propriety of removing the posterior wall of the auditory canal, I presented my specimens in the section of otology of the Congress of Scientists held at Heidelberg in 1889.

I then, according to the report contained in the *Transactions* of the Congress, expressed the following views:

"While, on the one hand, the results of the author's measurements warn us to limit the depth to which we penetrate, in the operation of chiselling as ordinarily done, these new experiments, on the other hand, actually urge us to penetrate still deeper. It is now recommended (by Küster and v. Bergmann) to get access to the tympanic cavity by chiselling away the posterior wall of the auditory canal. The question whether in this way an entrance into the tym-

panic cavity can be effected without danger is answered by the author in the negative, since in many cases, according to the specimens which he presents, this cannot be done without injuring the external semicircular and facial canals. In some cases the former projects farther out than the latter."

"While the part of the tympanic cavity lying within the region of the drum-membrane is accessible from the auditory canal, the upper part of the tympanum, called by the author the cupola-space [attic] cannot be reached in all its parts even after the removal of the drum-membrane and ossicles. In order to effect a cure of the processes which take place in the cupola-space, and which include the formation of polypi and the deposition of inspissated or cholesteatomatous masses, this space must be exposed to view. This may be accomplished in various ways:"

"1. By cutting through the layer of bone which separates it from the auditory canal, and which is called by Walb the pars ossea of the drum-membrane. The author uses for this purpose an instrument which he calls a double-chisel,[1] and shows pieces of bone which had been removed by it."

"2. In chiselling the mastoid, the antrum is enlarged anteriorly so that an unobstructed view can be got into the cupola-space."

"3. The entire anterior wall of the antrum and the pars ossea of the drum-membrane are removed, and thus a free communication is effected between the antrum and cupola-space and the auditory canal."

"The choice as to which of these methods is adopted depends upon the nature of the process in the cupola-space."

At the Second Congress of North-German Otologists, held April 7, 1890, in Berlin, I presented one of the cases upon which I had operated, making a free communication between the auditory canal, on the one hand, and the cupola-space and mastoid antrum on the other. The report in regard to it[2] reads as follows: "In the patient presented, the

[1] This instrument, which enables us to chip off small pieces of bone from the pars ossea even when the canal is narrow, is figured by Politzer in his *Textbook of Otology* (3d ed., 1893, p. 363) as a forceps-chisel made by Reiner. A similar instrument was recently recommended by Gellé.

[2] *Zeitschr. f. Ohrenheilk.*, xxi., 104.

operation had been performed by the reporter by detaching the auricle and carrying it forward, opening the antrum, and removing the bony wall separating the antrum from the auditory canal as far as Shrapnell's membrane (which was destroyed), *i. e.*, as far as the cupola-space. Through the opening thus made a drainage-tube was passed from the mastoid process to the auditory canal. After the tube had been removed, the posterior opening closed and suppuration ceased, while the gap which had been made in the postero-superior wall of the canal, and which extended from Rivini's segment (pars ossea of the drum-membrane) to the mastoid antrum, remained. This afforded a view of the antrum, and could enable one to wash out the latter at any time by means of the tympanic cannula."

In the Tenth Convention of South-German and Swiss Otologists, held at Nürnberg, May 25, 1890,[1] Zaufal reported as follows his method of operating by chiselling through the mastoid into the tympanum[2]: "Zaufal operates thus. He forms a triangular flap, including within its limits the auricle and the cartilaginous canal, by making an incision through the skin and periosteum from the tip of the mastoid process to the summit of the superior root of the zygomatic process, and from there carrying it perpendicularly along the latter almost to the anterior border of the auricle. The periosteum is stripped up with the raspatory and at the same time the membranous portion of the posterior bony wall of the auditory canal is detached." "An ordinary Luer's forceps suffices for removing the postero-superior wall of the auditory canal down to a certain depth. For removing the innermost parts of the inferior lamina of the horizontal portion of the pars squamosa, which also forms the external boundary of the atticus externus (Politzer), and upon whose inner surface is found the malleo-incudal joint, Zaufal uses a very slender Luer's forceps, with which it is possible to nip off this part in a single clip. Thus the cavity in which the malleo-incudal joint lies is exposed,

[1] His first communication in regard to this was made at the Twelfth Session of the Association of German Physicians (Prague, April 18, 1890). Reported in *Prag. med. Wochenschr.*, April 30, 1890.

[2] *Zeitschr. f. Ohrenheilk.*, xxi., 130.

and now we have the very important task of removing the malleus and incus, or any remains that may be present, with the forceps or with a sharp spoon," etc. "The external wound is then sewed up without introducing a drainage-tube." [1]

Later publications in regard to the operation of exposing the tympanic cavity are found fully cited in Holmes's paper and for them I may be permitted to refer to the latter. I will simply confine myself to adducing the results of my investigations upon this point.

By my anatomical investigations upon horizontal sections through the middle of the external auditory meatus, and by making vertical sections through the inner end of the meatus and perpendicular to the axis of the latter, I have sought to determine how far chiselling of the posterior wall of the meatus is associated with danger for the facial canal and for the labyrinth, and particularly for the semicircular canals.

From my determinations it resulted that, if chiselling is done through the posterior wall of the canal into the drum-cavity, the facial or semicircular canal may be wounded if the chiselling extends 1 to 4 *mm* back of the sulcus tympanicus. The conditions are best shown by the appended illustration.

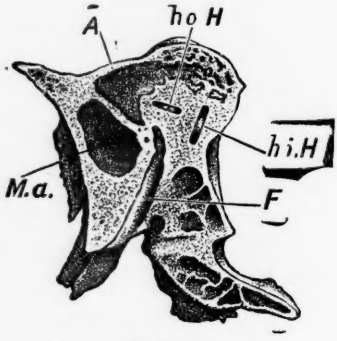

FIG. 1.

M. a. = meatus auditorius ; *F* = facial canal ; *A* = aditus ad antrum mastoideum ; *hi. H* = posterior vertical semicircular canal ; *ho. H* = horizontal semicircular canal.

[1] Zaufal specially emphasizes the fact that he has already operated upon fourteen cases in this manner (*l. c.*, p. 50).

Apart from the quite unfavorable conditions which chiselling of the posterior wall of the auditory canal offers from an anatomical standpoint, I consider it from a clinical standpoint unnecessary (at least as regards the inner and lower part of the canal), since the lower part of the tympanic cavity is readily accessible to manipulation performed through the meatus. If necessary, the projecting edge of the sulcus tympanicus may be removed by the double gouge-forceps.

Very different are the conditions with respect to that portion of the tympanic cavity which lies above Rivini segment, and for which I have introduced the name of cupola-space [attic]. Here the carious processes go on, and here are formed deposits of inspissated pus, cholesteatomatous masses, and granulations. While it is possible in some of these cases by washing with a tympanic cannula, by removing granulations, and by extracting the ossicles to effect a cure by manipulations conducted through the auditory canal, it seems requisite, in those cases in which a cure is not obtainable by this means, to supplement these measures by an operation, exposing the cupola-space, and, if necessary, the antrum as well.

In the specimens which I presented at the Tenth International Medical Congress in Berlin,[1] and which consisted of fifty horizontal sections made in macerated temporal bones through the middle of the auditory canal, the following dimensions were determined by measurement:

1. The distance of the spina supra meatum from (*a*) the facial canal, (*b*) the semicircular canals.

2. The distance of a point upon the surface of the mastoid situated 1 *cm* behind the spina supra meatum (site of election for operation) from (*a*) the facial canal, (*b*) the semicircular canals.

3. Distance of the sulcus tympanicus from (*a*) the facial canal, (*b*) the nearest semicircular canal.

4. Moreover, it was determined whether the facial canal or one of the semicircular canals projects farther towards

[1] *The Operation of Exposing the Cupola-Space, and the Anatomical Relations which bear upon the Possibility of Injuring the Facial Nerve and the Labyrinth in the Operation of Chiselling out the Mastoid.* Berlin, 1890.

the outside upon the face of the section, and whether either of these canals does or does not project as far externally as does the sulcus tympanicus.

It was determined that the distance from the spina supra meatum to the facial canal was in 18 cases 15 *mm* or less, in 2 cases 12 *mm*, and in 2 cases 13 *mm*, and that the distance from the spina supra meatum to the external semicircular canal was in 8 cases 15 *mm* or less, and in 5 cases 14 *mm*.

The distance from the site of election for the operation (1 *cm* behind the spina supra meatum) to the facial canal was in 10 cases 20 *mm* or less, and in 4 cases 18 *mm*; and the distance from the same point to the external semicircular canal was in 11 cases 20 *mm* or less, and in 3 cases 18 *mm*.

Hence it follows that in chiselling the mastoid we may strike the facial or the semicircular canal when we have gone in only 12 or 14 *mm* from the spina supra meatum, or 18 *mm* from the site of election for operation.

The danger of doing harm by going in too deep is less for the facial than for the semicircular canal. In our 50 sections we found in 18 the semicircular canal projecting farther exteriorly than the facial canal.

The superior semicircular canal participates in the formation of the inner wall of the mastoid antrum, and usually projects into the antrum itself, while the facial canal, which also projects into the latter, forms the boundary between the mastoid antrum and the cupola-space. Hence, if we go too deeply into the antrum we shall injure the labyrinth.

The distance from the sulcus tympanicus to the facial canal was in 1 case 1 *mm*, in 2 cases 2 *mm*, and in 13 cases 3 *mm*; and to the semicircular canal was in 1 case 4 *mm*, in 4 cases 5 *mm*.

These relations are best seen in sections made perpendicular to the axis of the auditory canal and through the inner end of the latter.

In 15 cases either the facial or the semicircular canal projected exteriorly as far as the posterior part of the sulcus tympanicus.

As has been already mentioned, it follows from these

measurements that if we chisel through the posterior wall into the tympanum, the facial or semicircular canal may be injured, if our chiselling is carried from 1 to 4 *mm* behind the sulcus tympanicus.

I cannot close this paper without emphazing a fact that has very frequently occurred in my experience. I find that, without going into an elaborate operation for chiselling into the posterior wall of the canal and exposing the tympanic cavity completely, a permanent cure may often be obtained by the employment of the tympanic cannula, the removal of granulations by the curette, the extraction of the ossicles, and in some cases by removing a portion of Rivini's segment with the forceps-chisel. This is possible even in cases when the necessity of making the more elaborate operation has been explained to the patient. On the other hand, if we keep within the bounds which are imposed by the anatomical conditions present, the operation of exposing the cupola-space and the antrum is less dangerous than a chiselling of the mastoid as it used to be done, and, moreover, it is the only operation that can with certainty effect a cure of a middle-ear suppuration which is not relieved by the other means mentioned above.

A CONTRIBUTION TO THE TECHNIQUE OF THE OPERATION OF TREPHINING FOR CEREBRAL ABSCESSES OF AURAL ORIGIN.

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Translated by Dr. S. E. Allen, Cincinnati, O.

(*With Plates III.–VII., of vol. xxv., German Edition.*)

THE operation of trephining the skull for cerebral abscesses of otitic origin is properly of recent date, although we find in the older literature two cases, one by Moraud (1751), and the other by Le Roux (1844), in which such abscesses were successfully operated upon. Here, however, there was perforation of the bony covering, and the widening of the fistula and laying open the abscess was all that was necessary to bring about a cure.

In the year 1886 we find recorded in literature for the first time, the fact of an otitic brain abscess, with intact dura and skull bones, being operated upon according to a regular plan. The honor belongs to Schede of having preceded all other surgeons in this matter. Since then the publications of these cases have piled up, and Heiman, in his paper on the subject, mentions thirty-two abscesses of aural origin seventeen of which were trephined, successfully.

The literature of this subject has increased greatly in later years, and the pathology, diagnosis, and treatment have been treated of exhaustively, but nevertheless it would seem to me that the technique of the operation has not received the attention which it deserves. Above all, an exact consideration of the anatomical conditions met with in trephining has

been neglected. It is evident that this knowledge of the anatomy is pre-eminently necessary. If we desire to do brain surgery, we must know not only which place on the skull is most advantageous for trephining, but also the boundaries within which we must keep the knife in the depth of the brain.

The anatomical conclusions stated in this paper are the results of dissections of thirteen cadavers and a number of hardened brains.

The methods of trephining employed in these cases of brain abscess of otitic origin are very numerous, taken in connection with the small number of operations performed. This is probably because we have as yet nothing upon which to base a localization of the abscess, and thus to determine the most fit place for the trephining.

In trephining for abscess of the temporal lobe, Bergmann bounds the operative field as follows: The upper border of the temporal lobe is formed by the fossa Sylvii, and above should in no case go. According to the general acceptation, this point approximately corresponds to the upper border of the squamous portion of the temporal bone. This upper limit can be marked off by a line drawn about 5 *cm* above the zygoma and parallel to it. The posterior border is marked by a line erected at the back edge of the mastoid process, perpendicular to a line connecting the lower edge of the orbit and the occipital tuberosity. The anterior border is formed by a second perpendicular, erected at the maxillary joint. The superior root of the zygoma runs as a ridge backward over the external meatus, and the lower limit of the opening must be at least 1 *cm* above this ridge.

Chauvel, who experimented on the cadaver, found that the temporal lobe was best gotten at from an opening immediately above the external meatus. More exactly defined, this spot is situated on a line drawn from the outer angle of the eye tangent to the top of the auricle. Its anterior and posterior boundaries are formed by two perpendiculars, erected, the one before and the other behind the auricle. Upon this horizontal line, just half-way between the two perpendiculars, lies the portion of the squamosal through

which we come directly upon the temporal lobe at its middle convolution. The point lies behind the bifuraction of the middle meningeal artery.

Greenfield located the opening quite far forward, placing the trephine an inch above the zygoma. The button of bone removed consisted of a part of the pars squamosa and a small piece of the great wing of the sphenoid. On the inner surface there was a groove for a branch of the middle meningeal artery.

Schwartze operated $2\frac{1}{2}$ *cm* above the upper border of the osseous meatus, and 1 *cm* posterior to an imaginary plumb line erected at the middle of the meatus.

With Jansen, the lower portion of the opening, which was about the size of a two-mark piece, lay $\frac{1}{2}$ *cm* above the border of the osseous meatus, and the anterior border about in a plane with the forward wall of the meatus.

Schede chiselled open the mastoid and cut away the roof of the process, and then evacuated the abscess by means of a puncture into the brain, without using the trephine externally at all.

If we examine the individual cases, we find that all operators, with the exception of Chauvel, Schede, and Greenfield, trephined somewhat behind and above the osseous meatus, often indeed above the posterior bounding line given by Bergmann. According to statistics, cerebral abscesses of aural origin occur both in cerebrum and cerebellum.

According to Barr's figures, in 76 cases:

56 times in the middle lobe of the brain.
13 times in the cerebellum.
4 times in cerebrum and cerebellum.
2 times in the commissure.
2 times in the crura cerebelli.

According to Körner, in 100 cases:

62 times in the cerebrum.
32 times in the cerebellum.
6 times in both.

From facts mentioned in these statistics, we learn further that the great majority of cerebral abscesses occur in the temporal lobes and the fewest in the occipital lobes.

From the reports of other authors we can with certainty conclude that the temporal lobe and the cerebellum are almost exclusively the seat of abscesses of otitic origin.

We will take up first the temporal lobe. The temporal lobe is about eleven *cm* long and is situated in the middle cerebral fossa, with its anterior portion filling out the same, while posteriorly it rests upon the tentorium cerebelli. The lobe extends forward to the great wing of the sphenoid, posteriorly it runs continuously into the occipital and parietal lobes. It is separated from these last and from the frontal lobe by the Sylvian fissure.

We recognize three surfaces; an outer, somewhat convex; an inferior, slightly concave; and an upper, which it possesses properly only at its anterior portion.

The outer surface consists of two antero-posterior grooves and three convolutions, the first, second, and third temporal convolutions. Only an angular portion of the lowest of these belongs to the outer surface, as it is to be considered as belonging almost entirely to the under surface. The outer surface lies throughout against the bony covering; to a slight extent against the great wing of the sphenoid, against the pars squamosa in toto, and farther backward against a portion of the parietal bone.

The under surface consists of two long furrows and three convolutions: the above mentioned third temporal convolution, the gyrus occipito-temporalis, and farther inward the gyrus hippocampi, which last is continuous posteriorly with the gyrus linguæformis. This under surface anteriorly lies on the floor of the middle cerebral fossa, completely covering, therefore, the anterior surface of the pyramid clear to its point. The posterior part of this surface lies upon the tentorium cerebelli.

The upper surface is the smallest and becomes visible only on exposing and opening up the Sylvian fossa. This surface does not extend far back, only about 4 *cm*, but is of interest as upon it inwardly lies an important vessel, the art. fossæ Sylvii. This artery runs from forward and below, backward and upward, and supplies the adjacent parts.

The inner lower border of the temporal lobe, the gyrus hippocampi, borders on the thalamus opticus and optic tract and also on the pedunculus cerebri and the commissure. The upper inner portion of this lobe borders on different central ganglia, or may be said to continue into them, or we can say better, this portion borders on the lateral ventricle with its most important ganglia.

The lateral ventricles, two great cavities in the cerebrum, start 10 to 15 *cm* from the frontal lobes and extend backward into the occipital lobes. They lie directly under the white substance of the commissure, and are separated from each other in the middle by a thin dividing layer. They communicate through the foramen of Monro, a narrow opening, being all that is left of a large embryonic cleft. Through this the great vessels of the ventricles, the plexus chorioides laterales are connected together. The ventricle consists of an anterior, inferior, and posterior horn. In the anterior horn, forming the floor of the ventricle, we have the corpus striatum. This structure has a knob-like head and a thin tail, and extends diagonally from the front, backward and outward. It consists of gray and white substance, the first representing the caudate and lenticular nuclei. Somewhat backward and posterior from the corpus striatum lies the thalamus opticus. This enlarges posteriorly, forming the posterior tubercle or pulvinar, and its inner surface forms the outer wall of the third ventricle. Forward, between the caudate and lenticular nuclei, and farther back, between lenticular nucleus and optic thalamus, lies a mass of white substance, the so-called internal capsule. This is continuous backward and downward with the pedunculus cerebri. I mention the internal capsule especially because it represents the important point of union of the nerve fibres which come from the cerebrum, and which, continuing, pass through the pedunculi with fibres coming from the central ganglia, especially with those from the lenticular nucleus.

The lower horn begins just back and below the thalamus opticus, being partially covered posteriorly by that portion of the thalamus known as the pulvinar. This inferior horn ex-

tends forward 3 to 4 *cm*, reaching almost the anterior end of the thalamus. We find on the floor of this horn the cornu ammonis, arching from the rear and medially, outward and forward. Lying on the cornu ammonis, we have the great lateral choroidal plexus, which extends far into the end of the inferior horn of the ventricle. In the posterior horn, which begins just at the commencement of the anterior horn, we find the calcar avis (hippocampus minor) and the eminentia Meckelii (eminentia collateralis).

Of the ganglia forming the inner boundary of the temporal lobe, we have to consider especially the nucleus lentiformis and the thalamus opticus. The pedunculus cerebri and the pons also come into consideration to a slight extent. Of especial importance are the relations and situation of the lateral ventricles, above all of the inferior horns of these ventricles.

As is evident from the above the temporal lobe presents against the bone a surface 11 by 4 *cm* in extent. We have therefore considerable play in exposing it, and all the previously practical methods of operating have accomplished their purpose as far as laying bare the bone is concerned. There remains, however, for us to consider the situation and relations of the lower surface of the lobe to the central ganglia and to the lateral ventricle.

The whole chain of ganglia which are of interest to us, from the nucleus lentiformis to the pons, lie opposite the entire length of the ventricle, and we run the danger of causing unwished-for and dangerous damage in penetrating into the depths of the lobe. According to my measurements, the distance to the outer surface of the nucleus lentiformis, perpendicularly inward 3 *cm* anterior to a plumb line let fall at the margin of the external meatus, is about 4 *cm* (reckoned from the inner plate of the bone). Directly over the meatus, and slightly backward from it, the distance is also 4 *cm*; to the thalamus and internal capsule, 4 to 5 *cm*; to the pons, 5 to $5\frac{1}{2}$ *cm*. The upper border of the temporal lobe is about $1\frac{1}{2}$ *cm* lower than the floor of the anterior horn of the ventricle. At the posterior portion of the thalamus, this difference in level disappears, and the inferior horn in its deepest

portion can lie 2 to 3 *cm* deeper than the upper border of the lobe.

I should like to call especial attention to the fact that, according to my measurements, the size of the lateral ventricles varies greatly. Sometimes we find the anterior and posterior horns running far into the frontal and occipital lobes, respectively, so that the ventricles can be 15 *cm* long. In the posterior and inferior horns irregularities are often met with. In some cases I found the inferior horn extending far outward, so that the distance between it and the outer surface of the lobe was but $2\frac{1}{2}$ to 3 *cm*. (I have never seen this distance greater than 4 *cm*.) On the other hand, the distance between the floor of the inferior horn, ordinarily $1\frac{1}{2}$ to 2 *cm* above the pyramid, and the surface of the lobe was sometimes found to be but 1 *cm*. These measurements have of course only a relative value. In examining them we must take into consideration the size of the brain itself—that is, the breadth of the skull. In the measurements made by me on about 60 skulls, this breadth, in the region of the petrous bone, was from 12 to 15 *cm*; on an average, $13\frac{1}{2}$ *cm*. I should like to mention also, that my examinations were on the adult brain; children's brains I have not examined. We can lay down the general rule: *That the smaller the skull, the nearer the inferior horn lies to the surface, and the greater care must be taken in penetrating into the depths of the lobe.*

If we make a frontal cut in the anterior portion of the temporal lobe, about corresponding to Greenfield's place for trephining, we strike the lenticular nucleus at the upper part of the section, but can only wound the ventricle if we cut far up. We must not forget, however, that the arteria fossæ Sylvii may come within the operative field and be injured. I would advise, therefore, that the knife be not directed too far forward. (Fig. 3, Plates III. and IV.)

If we make a frontal section in the plane of the outer meatus, which plane about strikes the commissura mollis, we determine the following: That if the knife is introduced 2 to 4 *cm* above the meatus, we strike the lenticular nucleus at a depth of 4 *cm*; that we reach with certainty the inferior horn and the choroidal plexus if the knife is not introduced

too high; and that we run the danger of wounding these latter parts at a depth of from $2\frac{1}{2}$ to 3 *cm.* (Fig. 2, Plates III. and IV.) As a rule, on a frontal section made about 1 *cm* anterior to the meatus, the lower horn is no longer to be found. Such a section, made 2 *cm* behind the meatus, strikes just between the posterior and inferior horns; at this place the ventricle lies opposite the temporal lobe, expanding out to a considerable extent in an upward and downward direction.

The question as to how deep we can penetrate into the brain without injury must be answered differently, according to the point on the lobe which we choose for trephining. If we operate according to Greenfield, we can penetrate 4 *cm* without fear of wounding the ventricle or the lenticular nucleus. If, on the contrary, we operate perpendicularly above the meatus, or somewhat behind, or in front of same, we are forced to go to different depths, according as to whether we pierce the lobe 1 to 2 *cm* over the meatus, or higher. If we choose our position high, in the neighborhood of the upper limit of the lobe, we reach the ventricle at from 4 to 5 *cm.* If we enter 2 *cm* above the meatus, we arrive at the inferior horn at a depth of from $2\frac{1}{2}$ to 3 *cm*, and can wound the choroidal plexus. The statement of Von Bergmann, that one can penetrate into brain to a depth of from 4 to 5 *cm* without fear of injury, is, therefore, only to be accepted with limitations. Moreover, I may mention that injury of the central ganglia is not always necessarily dangerous, although it is always threatening and should be avoided as far as possible. Especially are we to avoid injury to the internal capsule and to the ventricle. I advise never to penetrate deeper than 3 *cm*, and am of the opinion that it will be almost never necessary to go deeper. If we keep in mind the fact that the general run of abscesses always arise in the temporal lobe, and then extend inward, we can see that they can be generally reached, if not too extensive, at a depth of 3 *cm.*

Are we able to diagnose an abscess in the temporal lobe? Can we from the symptoms locate such an abscess with certainty?

All authors agree that the diagnosis of a cerebral abscess

is extremely difficult, and that its location is especially uncertain. Cases are frequent in which a cerebral abscess runs a latent course, and the post-mortem first gives us knowledge of a trouble which, during the life of the patient, had given rise to no marked disturbance. Such patients complain of troubles of quite a vague nature: headache, loss of appetite, nausea, etc., but lack every symptom from which the diagnosis of brain abscess can be made. In many cases the diagnosis can be made in all probability, but without our being able to determine its exact situation.

In looking over the cases of otitic brain abscess hitherto reported, I can recall but one in which the situation of the abscess was exactly given, namely, in the case of Jansen. Here it was possible to locate the abscess in the neighborhood of the thalamus opticus and internal capsule. In all other cases the diagnosis reads simply, "situation of the abscess in temporal lobe or cerebellum."

We know the reason why an abscess in the temporal lobe gives rise to such slight, and, for diagnostic purposes, useless symptoms, and the reason becomes clear to us if we consider the ordinary situation of the abscess in the lobe.

At the start, a temporal lobe abscess is situated in the white substance, and only on development does it extend to the cortex or central ganglia, as the case may be. The white substance is irrelevant, it simply is a means of connecting the fibres from the cortex with the internal capsule or periphery. Before this connection becomes completely destroyed the abscess has to reach an enormous size. Abscesses have even been observed which filled out the entire white substance, without having given rise to any functional symptoms. It is known that we can spoon out the white substance without observing functional disturbance. The abscess brings about paresis or paralytic functional troubles only when it attacks the cortex, either directly or indirectly, or the central ganglia—that is, when it attacks the portions of the brain bordering on the temporal lobe.

In order to understand this better we must consider more fully the physiology of the temporal lobe and the neighboring parts concerned. (Fig. 4, Plate V., and Fig. 5, Plates VI. and VII.)

Physiology places the centre for hearing in the temporal lobe; at least, we observe absolute loss of hearing on the opposite side after complete destruction of the cortex of this lobe. With abscess of the temporal lobe, loss of hearing in the opposite side, which can alone be due to destruction of the cortex, has not yet been observed. In the case of Jansen, the loss of hearing was due undoubtedly to exudation in the middle ear. An abscess in the temporal lobe would hardly cause an extensive destruction of the cortex, and so I think this symptom will almost never arise.

As is known, and as has been demonstrated in a number of cases, disturbances in speech are observed in abscess of the left temporal lobe, a symptom which points with the greatest probability to the situation of the abscess in this lobe. The centre for speech movements is situated in the left third frontal convolution. This centre lies so far from the temporal lobe that only an abscess occurring in the most anterior portion of the temporal lobe and extending over to the third frontal convolution or irritating the same, could bring about this disturbance. Wernicke has lately found that the centre for amnesic aphasia lies in the temporal lobe, in the posterior two-thirds of the first temporal convolution. When this symptom is present, we will have to locate the abscess high up in the temporal lobe; it may be it has started at this point, or it may have extended that far from the region of the petrous portion of bone.

We must above all hold fast to the fact that we cannot ascribe any influence on the motility or sensibility to the cortex of the temporal lobe. These centres are situated much higher, although it must be admitted that the centres for the facial and the hypoglossal border on the temporal lobe. Paralyses of the facial and also of the tongue have been observed in abscess of the temporal lobe, and it is possible that an abscess situated high up and in the anterior portion of the lobe could bring about these paralyses. In such a case, however, other paralytic symptoms would scarcely be lacking. The centre for speech movements borders directly on the island of Reil, which is looked upon as the centre for

laryngeal movements, and the conducting fibres from it run from the third frontal convolution through the back edge of the island of Reil toward the inner capsule at the posterior inner border of the lenticular nucleus, and can therefore be readily interfered with. We must bear in mind, however, that irritation of the centre for speech movements and its conducting fibres can only be considered with abscess on the left side.

There are, as I have stated above, with the exception of the above centres, no motory or sensory centres in the temporal lobe. If we observe, therefore, those motory and sensory disturbances, which are the most important symptoms of a cerebral abscess, in connection with an abscess in the temporal lobe, this lobe itself cannot be made answerable for the symptoms. The abscess must either affect, by its extension, the motory and sensory centres which lie in the parietal lobe, or disturb the conducting fibres arising from the same. Moreover, I hold that, with abscess in the temporal lobe, both direct and indirect irritation of the motory or sensory centres can be excluded, with the exception of the centres for the facial and hypoglossal. The former centres are situated much too high, and it is only the conducting fibres that can come into consideration.

Suppose we take a temporal lobe abscess which has arisen primarily in the white substance, as is generally the case ; it is clear that the same by extension inwards must affect parts of the lesion which will as a consequence be followed by central disturbances. In the first place, the abscess, by extension inward, will strike the lenticular nucleus, and we know from physiology, that a lesion of this great bundle of ganglia can bring about opposite-sided motility disturbances. By still farther penetration, the abscess reaches the internal capsule ; this has a length of from 5 to 6 *cm* and can therefore be easily reached, in its entire length, by a temporal lobe abscess.

Now we know that the conducting fibres from the motory as well as from the sensory and psychical centres of cerebral cortex, pass through the internal capsule and from there into the pedunculus cerebri, commissure, etc., and it is evident

that a lesion of these tracts will have the same results as a destruction of the respective centres. A necessary consequence of such lesion will be central disturbances which will be observed the more pronouncedly the more fibres there are destroyed or irritated. It has been determined that these nerve fibres pass collectively through the posterior shank of the internal capsule, the tract for the facial being farthest forward, following which come the motor fibres, and farthest back the sensory and psychical fibres. Accordingly, therefore, as an abscess presses against the back shank of the capsule and irritates it, we will have central disturbances of different kinds. We can seldom expect to see a total hemiplegia or hemianæsthesia develop as in an apoplectic lesion of the capsule which completely obliterates the conducting fibres, but must take into account that the abscess grows but slowly toward the capsule, and the fibres become irritated either directly by pressure or indirectly by an œdematous saturation of the neighboring tissues. Accordingly we observe focal disturbances of a moderate grade, convulsions, paresis of an arm with more or less reduction of sensibility, perhaps with paresis of a leg. A purulent breaking down of the posterior portion of the capsule is generally out of the question. In nearly every case, before this could develop, an occurrence arises which renders the death of the patient a consequent necessity, namely, the rupture of the abscess into the lateral ventricle.

It is known, and the clinical histories published up to now agree with this fully, that ordinarily death follows soon after focal appearances of motory or sensory nature arise. These symptoms, which allow of a certain diagnosis, were perhaps preceded by disturbances of a more general and vague nature, together with symptoms of intracranial pressure. These vague appearances make the diagnosis of cerebral abscess probable, but in the absence of focal disturbances do not allow of a certain diagnosis or of the localization of the abscess. An abscess situated in the temporal lobe above the petrous bone will, on extension inward, strike the outer wall of the inferior horn and push the same inward; only one situated high up in the lobe will strike

the lenticular nucleus and subsequently irritate the internal capsule, the inferior horn also running the danger of being affected. If the abscess lies, however, far forward in the lobe, the inferior horn is no longer concerned, and the abscess, in the direction inward and upward, will strike the lenticular nucleus and then the front shank of the internal capsule. In this case we will the easier miss characteristic symptoms, since we are nowadays doubtful whether the paralytic symptoms accompanying injury to the lenticular nucleus are not due to the participation of the posterior shank of the internal capsule. At least observations have taught us that the paralyses arising from lesions of the lenticular nucleus are always followed by a complete return of function, whereas those following a direct attack of the internal capsule can never be recovered from. It is possible for the abscess to cause the walls of the ventricle to fuse together, when it can press forward unhindered. It is more probable, however, that the abscess causes a great thinning of the wall of the inferior horn by its continued extension, and eventually bursts through the same, discharging the pus into the ventricle. Such cases have been frequently described *post mortem*, where focal symptoms of a motory or sensory nature had arisen shortly before death.

It seems striking to me that hemiopia has not been oftener observed in temporal lobe abscess. I recall but one case in which this symptom is mentioned, in the one reported by Jansen, although it was once made out by Janeway in a case of traumatic abscess in the occipital lobe, and once by Wernicke and Hahn in a case of tubercular abscess in the same lobe. In the first place, the fibres from the centre for sight in the occipital lobe run along the outer wall of the posterior horn to the optic nerve, and can therefore be touched by an abscess situated somewhat posteriorly. Then the optic tract arises from the thalamus opticus, and runs outward, downward, and forward, and surrounds the pedunculus cerebri. And finally, from physiology we know that lesions of the most posterior portion of the posterior shank of the internal capsule cause hemiopia. At any rate it is to be recommended to examine for hemiopia when we suspect

an abscess in the temporal lobe. With focal disturbances in the motor, or especially the sensory areas—that is to say, with abscesses which irritate the internal capsule, we are not likely to miss this symptom.

From the above physiological data, I am convinced that in those cases of temporal lobe abscess which are accompanied by focal disturbances, it will be possible for us to make the diagnosis, and also to determine more exactly the situation of the abscess. If we find symptoms indicative of a cerebral abscess, such as headache, fever, vomiting, choked disc, etc., together with amnesic speech disturbances, in cases having a preceding or still existing otorrhœa, we may safely draw the conclusion that an abscess has developed in the left temporal lobe in the posterior two-thirds of the first temporal convolution. When suspicious of an abscess in the temporal lobe, if we find sensory and motor disturbances of the extremities, to which is added paralysis of the facial, we are in a position to localize the abscess. In this case, the abscess will be found in the region of the posterior shank of the internal capsule. With only partial disappearance of function in this group, it may be of motility or of sensibility, we are justified in locating the abscess in this region.

Facial nerve paralysis of the opposite side as the only focal symptom indicates that the abscess on extension to the internal capsule has irritated only the conducting fibres from the facial centre. This centre is situated at the bend of the capsule, and on account of the close proximity of the motor zone, other focal symptoms will not be slow in manifesting themselves. The abscess may lie well forward and upward in the temporal lobe, in which case we will observe paralysis of the hypoglossal soon following that of the facial, and also motor aphasia and disturbances in the laryngeal movements. If the facial paralysis shows itself on the diseased side, there must have arisen either an erosion of the Fallopian canal, as is ordinarily the case, or we have an intracranial process present, which affects the nerve in the skull cavity. With such symptoms, we should think first of all of a cerebellar abscess. I shall return to this later on.

If hemiopia appears as the only symptom of localized trouble, the abscess has attacked the conducting fibres from the sight centre, and we are to seek it farther backward and inward. In all other cases, we will find hemiopia combined with other focal symptoms. Of course the possibility is not excluded of an abscess at the bottom of the middle fossa extending far inward and exercising a pressure on the tractus opticus, and thus giving rise to this single symptom of hemiopia. Generally, however, we will observe other disturbances as well. Unfortunately, in the majority of cases of otitic brain abscess, those focal symptoms are absent by which the abscess could be located. We are to-day, however, as experience and the more recent works teach us, no longer required to trust to accident alone in finding the abscess. In spite of the absence of focal disturbances, we have indicative conditions which are able to give a determined direction to surgical interference in the concrete case. In the first place, experience teaches us that these abscesses in the temporal lobe generally appear after disease in the tympanic cavity, especially after disease in its upper part, in the antrum, and in the roof of the mastoid. Cerebellar abscesses, on the other hand, are more frequent after disease processes which occur in the region of the posterior fossa, especially after those which originate in the osseous sigmoid sulcus and in its neighborhood.

Körner, in 1889, published the records of ninety-one post-mortems and observations on nine cases of trephining on the living, both showing that the great majority of abscesses complicating middle-ear suppurations are situated near the place of the primary trouble, and not seldom in evident connection with the same.

Lately, Jansen has arrived at the same conclusion. Among seven cases of cerebral abscess, six only being examined *post mortem*, the abscesses were directly connected with the purulent foci in the petrous portion by fistulae or by gangrenous tissue. In one case the connection was through a thrombosed vena auditiva interna and a purulently infiltrated acoustic nerve, and once there was no direct communication, but the abscess was separated from the dura and bone

simply by a thin layer of discolored brain substance. In the case that was operated upon, no direct connection between the abscess and the petrous bone could be proven, but the two were in close proximity. These results of Jansen substantiate those of Körner. We must throw aside the old teaching of von Bergmann, that the abscess nearly always lies at a distance from the primary disease, and separated from the same by a layer of unaltered brain substance.

Von Bergmann considers the veins the most ready carriers of the infection, and he believes that there is first a thrombosis, and on some place in the course of the diseased vein a purulent breaking down takes place with the formation of the abscess. This view he bases on post-mortems which show the condition above cited in reference to the transverse sinus and neighboring large venous trunks, and he believes himself justified in attributing the same condition to the veins in the brain itself. He says concerning this: "Cases have been described where the thrombus was found organized for a distance, while farther away soft purulent masses filled the calibre of the vein. Perhaps this condition is not unimportant in explaining the break of continuity between many deep brain abscesses and the place of the original suppuration." And farther on: "This view has more probability for the still unexplained origin of these abscesses than the interrupted extension of the inflammation in the lymphatic and perivascular spaces. When the abscess has formed, a trace of the path along which it extended into the depth is still to be perceived in the obliteration of the vein."

There can be no doubt that an abscess can occur far removed from the primary trouble, whichever way we designate as the most frequent, by thrombosis of the vessels or the conduction of micro-organisms through the lymph channels, and there is no reason why we cannot accept both ways. However, the post-mortems made up to date, and these alone are relevant, teach us that such an occurrence must be considered not the rule but the exception.

I give here, on account of its interest, the history of a case which I observed some months ago. It was one of subdural abscess, which offers an apt example of the origin of the

discontinuity between deep abscesses and the place of the original suppuration. Moreover, only a few such cases of primary subdural abscess have been observed.

Frau H., thirty-six years old. No former ear trouble. Was taken in middle of October, 1892, with an acute left-sided middle-ear suppuration, with great discharge and violent pain in left side of head. Worse at night. Unable to localize the pain more definitely. Sent to me on 16th Nov., 1892. Drum behind and above bulged out with a narrow opening at the tip of the sack, out of which pus oozed. Mastoid not sensitive to pressure and not swollen. Left side of head not sensitive on percussion. Loud whispering heard close to the ear. Weber experiment, left.

Daily treatment did not relieve the pain and the suppuration continued unaltered. Beginning of January, the patient, who had not been to me for a week, sent for me as she was confined to bed. The same picture as before, only the mastoid is at its base slightly sensitive to pressure. Fever, on the days that I observed the patient, somewhat over 38°. Patient much reduced. No choked disc.

I intended to open the mastoid as I suspected a hidden intra-cranial focus of inflammation, but concluded to wait, since no appearances were present which pointed to disease in the mastoid cells.

Jan. 20th.—Œdematous swelling two fingers broad behind the articulation of the concha. Pain on pressure. No pain any longer on pressure over mastoid.

Jan. 24th. Operation. Pus found in swelling back of the ear. Fistula in bone corresponding to the posterior inferior angle of the parietal bone. A piece of bone the size of a two-mark piece removed and a fistula thus opened up and subdural abscess laid bare. Dura lined with spongy granulations. These removed with sharp spoon. Lively pulsation of the brain. Antrum opened thoroughly and found to contain no pus. Also no pus in mastoid. No connection could be found between abscess and antrum or middle ear, in spite of the fact that it was carefully sought for.

Headache disappeared soon after the operation. General condition good. Suppuration in ear soon subsided. May 10, 1893, trephine wound healed and patient dismissed cured. She states that off and on she suffers with slight headache ; feels perfectly well otherwise. She looks splendid and has gained in weight. Her only complaint is that her memory is not so good as formerly,

probably a sign that a portion of a cerebral convolution has been destroyed at the seat of the abscess.

Here we had to do with a subdural abscess that developed at a distance from the middle ear, certainly 5 to 6 *cm* backward and above. Its development was probably at or soon after the beginning of the middle-ear inflammation, as we can conclude from the occurrence of violent headache at the very commencement. It seems to me more probable that the lymph channels offered the means of transit to the subdural space for the septic matter, and occasioned an acute so-called primary abscess. I am inclined to the view that abscesses developing far removed from the place of the primary trouble are to be observed principally in acute cases of suppuration. This can be understood when we consider that in acute suppurations not only the mucous membrane of the middle ear becomes more or less markedly succulent and hyperæmic, but, according to the degree of inflammation, the entire neighboring tissue takes on the same condition for a distance often far removed from the middle ear. The vessels, above all the perivascular lymph spaces, appear therefore especially fitted for taking up and transporting septic matter to the subdural space and deeper parts of the brain. If notwithstanding this, we observe but seldom the formation of abscesses far from the ear in acute suppurations, this is but a further proof of what has been said regarding the ordinary course in the formation of a cerebral abscess.

If, on the other hand, we investigate the condition of the tissues in *chronic* suppurations, we find the inflammatory reaction, swelling and hyperæmia of the mucous membrane and surrounding parts, less marked ; in many, especially in uncomplicated cases, more limited to the mucous membrane itself. As the disease progresses we have erosion of the mucous membrane, the purulent process attacks the bone, carious destruction takes place, and finally we have complete perforation of the same. Before the carious perforation is complete a reactive inflammation in the overlying dura develops, we have a cellular infiltration, a connective-tissue thickening of the same, and its more or less pronounced adherence to the petrous bone. The dura thus forms a sort

of check against the further extension of the suppuration and protects the underlying brain. If drainage is unfavorable, which, as is known, is especially apt to occur in suppurations in the attic, we get a purulent destruction of the dura at some point and the formation of a fistula in the same. The suppuration then attacks the brain substance; this softens, and we finally have what I call a typical brain abscess—that is, one which is in direct connection through a fistula in the dura with the original purulent focus. As variations of this form are to be considered cases where there is no fistula and the abscess lies close to the bone, the dura being thickened, discolored, and maybe adherent, or where there is only a thin layer of discolored and softened brain substance between the abscess and bone. On the other hand, I designate those abscesses atypical which develop far from the petrous bone and are separated from the latter by a layer of unaltered brain substance.

We have yet to consider, for the sake of completeness, the relation of traumatic abscesses to the primary purulent focus. For this purpose I have examined the statistical work of Bluhm who has compiled reports of 46 cases of traumatic brain abscess, 22 of which were saved by operative interference. His statistics show the remarkable fact that with 18 abscesses there was a direct communication with the original purulent focus, and that 14 times the dura was discolored or adherent and the abscess lay directly beneath it. In 10 cases no specification is made, and in 4 cases only is it expressly stated that the abscess was separated from the primary focus by a layer of healthy brain substance. These statistics show, therefore, that in the great majority of cases of traumatic abscess, the abscess is situated close to the part affected by the trauma. Indeed, I cannot understand why otitic should differ from traumatic abscesses, as the precedent conditions necessary for the formation of an abscess in the internal or external portions of the brain are the same, with the single difference that in the traumatic abscesses a wound, and in otitic abscesses a middle-ear inflammation, gives occasion to the suppuration in bone and brain.

According to the above, and especially to the revelation of post-mortem examinations, no doubt can longer remain but that the great majority of otitic cerebral abscesses are situated close to the petrous bone, in part indeed in immediate connection with the same. As a consequence the present and former surgical therapy must be essentially altered. It is evident that those methods now practised, in which the place for trephining is chosen far from the outer meatus, either perpendicularly above or to the front or rear of same, must be supplanted by those in which the trephine is kept close to the petrous bone, as this will give a sure guaranty of striking the abscess. Körner recommended in the above mentioned work that the upper wall of the meatus be chiselled away into the drum cavity, the tegmen tympani and any other diseased bone removed, and the abscess incised from the meatus and tympanic cavity. Schede is the only one of all operators who, as far as I know, has operated by chiselling open the mastoid and then trephining directly into the skull, opening up the roof of the mastoid, and incising the abscess from below. In his first case the operation was facilitated after opening the mastoid by the discovery of a fistula leading into the abscess. In the second case, without a more accurate clue as to the situation of the abscess, he cut in at the same place. A cure resulted in both cases. Von Truckenbrod, who described both cases, considered the favorable drainage an especial advantage of the method. I should like to recommend the following method.

If symptoms of a brain abscess arise in the course of an otorrhœa, we should, as Schwartze has pointed out, open up the mastoid before proceeding to trephine. In this way, in many cases, see those of Schede and Schwartze, we may come upon the abscess at once. It is also possible that the brain symptoms may disappear after a simple chiselling open of the mastoid, performed always according to the method of Stacke. If the mastoid has been opened and the brain symptoms continue unaltered, I advise trephining, the opening to have the size of a three-mark piece at least. The centre of the opening is to be perpendicularly over the bony

meatus, so that its lower border cuts directly through the roof of the meatus. The meatus is then chiselled off to a depth of $1\frac{1}{2}$ *cm*, as is also the roof of the mastoid, and the dura, with the brain substance beneath, raised up in order to expose the tegmen tympani et antri, the two places where, according to experience, the carious rupture oftenest takes place. We can easily determine whether these two bony coverings show carious spots, and whether the dura is fistulous, adherent, or discolored. An extradural abscess, if found, can also be easily opened up by this method. I have found from measurements that the roof of the tegmen tympani is from 2 to $2\frac{1}{2}$ *cm* from the inner table of the squamous portion; it also lies directly on a line projected perpendicularly inward through the external meatus. On this line also lies the posterior shank of the internal capsule, if we think of it as being raised a little.

If we find the dura fistulous or adherent, the operation is simplified; we have to widen the fistula and thoroughly expose the abscess for the purpose of giving good drainage. We must remember, however, the limits within which the knife has to be confined. If one to two *cm* above the petrous bone, we should never sink the knife deeper than 3 *cm*, otherwise we run the danger of wounding the inferior horn. It is self-evident that we must not neglect to remove as far as possible any diseased bone that may be found.

If we find no fistula, and also no other indications from which we can conclude that the abscess is close to the petrous bone, we are first to seek the abscess here, and then to incise other parts of the brain. Von Bergmann has recommended that we substitute for an exploring needle the knife when sticking into the brain substance. I should recommend that this method be given preference only with limitations. If we can determine without doubt where the abscess lies, which is the case with fistula formation or with adherent dura, we immediately make a broad cut into the same; on the other hand, if we do not find these changes, and have to guess at the situation of the abscess, I see no reason why we should not first make punctures with the needle. It may require many punctures before the abscess

is struck, and although a cut into the brain with the knife does not in and of itself cause any great danger, still the exploring needle will not wound the brain as much as the knife. It is well, however, always to use a needle with large calibre, as the contents of the abscess can be quite thick and crumbling. I also consider it proper to leave the dura in situ when using the needle, and to cut the dura only when the abscess has been found. We can in this way easier avoid a prolapse of the brain substance.

I should like to see the above method applied to those cases in which the symptoms point to an abscess high up in the temporal lobe—that is, where we have pronounced amnesic aphasic disturbances. If in these cases we do not find the abscess near the petrous bone, the trephine opening is to be widened backward and upward and an attempt made to puncture the first temporal convolution, situated from 3 to 4 *cm* above the meatus.

If the abscess is not found near the petrous bone, and if all signs which locate it more exactly in the temporal lobe fail, and if the symptoms still point to a cerebral abscess which we cannot place in the cerebellum, I would not hesitate to puncture with the needle in ten to fifteen places at least. In these cases we must proceed according to the method of Bramann and form a skin-periosteal flap with which we can afterward cover up the trephine hole. By this means we do not have to fear the much-dreaded cerebral œdema after laying bare a large portion of the brain.

The danger of the operation is not so very great, while an unopened brain abscess is always fatal. I therefore do not believe in putting off the operation till focal symptoms occur which render the diagnosis certain, but operate if the brain symptoms do not subside after chiselling open the mastoid. Above all, we should not procrastinate when there are symptoms of increased intracranial pressure, intense, unbearable headache limited to affected side, choked disc, and steady loss of flesh with otherwise intact organs. Early operation is the more proper, because, in the first place, trephining is not so momentous as has been pictured, and, secondly, a cerebral abscess can suddenly cause death without

having shown any characteristic premonitory or focal symptoms. The operation will then in many cases come too late.

I shall not go into the after-treatment of cases of cerebral abscess. I prefer to stuff the abscess cavity with iodoform gauze rather than introduce a hard drainage tube. Above all, and this cannot be too strongly emphasized, we must seek to definitely cure the suppuration in the middle ear.

We now turn our attention to the cerebellum.

If we consider the relation of the cerebellum to the pyramid and to the mastoid, we find that it lies for a considerable extent immediately upon these, and all suppurative processes which take place in the posterior part of the petrous portion and mastoid will endanger the cerebellum. Experience teaches us that suppurations in the mastoid very readily break through the bone at the sulcus sigmoideus or in its immediate neighborhood. We get then a purulent pachymeningitis externa, which we often find developed on the dura covering the transverse sinus, and, as a subsequent condition, a deep abscess with or without thrombosis of the sinus. Unfortunately cerebellar abscesses present characteristic signs, from which a diagnosis can be safely made, to a still less degree than cerebral abscesses.

Schwartze has stated that pain especially in the occipital region is characteristic, but this is hardly true. Neither is absence of bone-conduction on the affected side (McBride and Miller) of diagnostic value.

It is generally accepted that co-ordination disturbances, staggering gait, falling toward diseased side, etc., justify a diagnosis of cerebellar abscess.

Now these co-ordination disturbances have almost never been observed ; only in the one case by Schwartze were they present to a pathognomonic extent. They are no sure proof of the presence of a cerebellar abscess, since they can occur in other cerebral diseases, especially in those which affect the corpora quadrigemina. We cannot wonder that co-ordination disturbances occur so seldom in these cases, since, according to Luciani, each portion of the cerebellum has the same function as the whole, destruction of one portion being compensated for by other portions. As these

abscesses ordinarily grow slowly we can easily understand the lack of characteristic symptoms. Both the facial and acoustic nerves might be attacked by a cerebellar abscess situated quite near the porus acusticus internus ; but an affection of neither would be pathognomonic, as a facial paralysis might be due to erosion within the bone, and an otorrhœa causes hearing disturbances in and of itself.[1]

If the abscess lies more backward and inward there is danger to the pons, medulla, and to the last ten cerebral nerves. If situated in the anterior upper and middle part of the cerebellum the corpora quadrigemina are in danger, lesions of which give rise to co-ordination disturbances, visual anomalies, non-reaction of pupils, and blindness. Since these appearances have almost never been observed, we can believe that abscesses ordinarily do not extend to these dangerous zones.

Clinicians have long known that tumors, abscesses, and other pathological products that take up intracranial space, lead oftener to bilateral choked disc when in the cerebellum, than the same conditions in other parts of the brain. The presence of bilateral choked disc can therefore be taken as an indication of cerebellar abscess.

Bramann explains this remarkable fact as follows: "By pressure of the tumor or abscess in the cerebellum upon the transverse sinus, which empties into the superior petrosal sinus, and upon the superior and inferior petrosal sinuses, both of which get their blood from the cavernous sinus, we have a stasis in the latter sinus and a damming back of blood into the ophthalmic veins, the necessary consequence of which is a bilateral choked disc."

Abscess in the temporal lobe leads, according to von Bramann, much less frequently to choked disc. To bring this about the abscess must be situated far inwards and press directly upon the cavernous sinus or upon the superior petrosal sinus. If an abscess situated far forward in the

[1] We must remember, however, that lesion of the facial peripheral to the ganglion geniculi does not generally cause a paralysis of the velum palati. The palate receives innervation through the superficial petrosal nerve which connects the ganglion geniculi with the ganglion spheno-palatinum. In suspicious cases, if we observe a simultaneous paralysis of face and palate, the diagnosis of cerebellar abscess is to be earnestly considered.

temporal lobe presses upon the ophthalmic vein, we get a unilateral choked disc. In this latter case, on account of the proximity of the optic nerve, disturbances in sight will seldom be absent.

From the above we see how difficult it is to diagnose a cerebellar abscess, and that its localization is out of the question.

As to trephining for a cerebellar abscess, von Bergmann advises that the middle of the opening be placed on the posterior boundary line of the field given by him for the trephine opening in cases of temporal lobe abscess. He forms a moderately large skin-periosteal flap, whose convexity reaches down to the outer surface of the pars mastoidea. In this way is laid bare the infero-posterior angle of the parietal bone and its articulation with the temporal and occipital bones, and also the emissarium mastoideum.

Chauvel advises the opening to be made on a level with the upper edge of the auricle and a finger's breadth posterior to the position given by him for abscess in the temporal lobe.

We have several guides for laying bare the cerebellum. As I found from the examination of 60 skulls, the point of union of the three sutures (sutura lambdoidea, parieto-mastoidea, and occipito-mastoidea) corresponds to the highest point of the sulcus sigmoideus. From here the sulcus transversus, with its sinus, arches slightly upward and backward, or runs quite horizontally or slightly upward to the protuberantia occipitalis interna. If we prolong the short horizontal portion of the sutura parieto-mastoidea backward, this line will about correspond to the course of the transverse sinus; perhaps the latter is, in many cases, situated a little lower.

We can determine the course of the transverse sinus still easier by drawing a line backward from the roof of the orbit, $\frac{1}{2}$ *cm* above the bony meatus. This line forms the upper boundary of the operative field.

We expect to find here, as in the case of the temporal lobe, that the abscess is situated near the temporal bone, and we have to proceed accordingly.

If we suspect a cerebellar abscess and the mastoid has

not been opened up, we have that to do first, and, if necessary, subsequently to trephine. If, on the other hand, the chiselling open has been done and the cerebral symptoms continue, I advise the following: A cut is to be made from 4 to 5 *cm* long from the middle of the auricle horizontally backward, and from the ends of this two perpendicular incisions upward, and at the anterior extremity a cut is to be made downwards to the tip of the mastoid. The skin-periosteal flaps thus formed are to be loosened up till the emissarium mastoideum becomes visible. The situation of the latter varies considerably, generally it is from 2 to 3 *cm* below the sutura parieto-mastoidea, either in the sutura occipito-mastoidea itself, or somewhat in front of the same.

When we have the operative field laid bare and the bleeding stopped, we have to chisel away the mastoid completely, until the posterior cerebral fossa is opened and the transverse sinus laid bare. I lay especial value on the free opening up of the sinus, as in cerebellar abscesses we find it often diseased, not seldom, perhaps, being the cause of the abscess. We have at the sigmoid sulcus the place where perforation takes place most readily in mastoid suppuration, and it is possible to quickly find the brain abscess from the fact of its being in immediate connection with, or disconnected but slightly from the perforation in the bone. As soon as the opening into the posterior cerebral fossa is great enough, I advise using Lüer's forceps, instead of the chisel. There is scarcely any danger of wounding the sinus, and the bone can be slowly chipped off until the opening has the desired size. The size should be at least that of a two-mark piece, and is to be placed so that its upper edge does not come above the sutura parieto-mastoidea. The trephine opening therefore sacrifices a large part of the sigmoid sulcus. When the opening is sufficiently large, the dura and overlying brain is to be raised upward and backward in order to render visible the sulcus sigmoideus up to the jugular fossa, and likewise the posterior surface of the petrous pyramid up to the porus acusticus internus. The internal meatus can, as we know from experience (see cases of Jansen and Rothholz), connect a middle-ear suppuration with a brain abscess. If there is no fistula and the dura is not adherent to the petrous

bone, the aspiration needle is to be introduced in the neighborhood of the petrous bone in different directions to a depth of 3 *cm.* Only when pus is found are we to incise with the knife and to treat the abscess according to general surgical rules.

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Explanation of the Plates.

FIGURE I.

1. Trephine opening according to Chauvel.
2. Trephine opening according to Greenfield.
3. Trephine opening according to von Bergmann.
4. Trephine opening with removal of roof of meatus and mastoid.
5. Trephine opening with removal of posterior portion of mastoid.
6. Trephine opening according to Schwartze.
7. Foramen mastoideum.
8, 9. Upper boundary line in operating on cerebellar abscesses.

FIGURE II.

The section runs somewhat obliquely downward and forward.

1. Parietal lobe.
2. Temporal lobe.
3. Lenticular nucleus.
4. Inferior cornu.
5. Internal capsule.
6. External capsule.
7. Thalamus opticus.
8. Lateral ventricle.

FIGURE III.

Section just in front of thalamus opticus.

1. Frontal lobe.
2. Temporal lobe.
3. Fossa Sylvii.
4. Lenticular nucleus.
5. Caudate nucleus.
6. Lateral ventricle.

FIGURE IV.

Horizontal section through cerebrum. On left side the lateral ventricle is laid open from above so that the anterior, inferior, and posterior horns are visible throughout. It can be seen that the inferior and also the posterior horn lies near the outer surface of the brain. On the right side the upper part of the corpus striatum and the couches of optic nerve have been removed by a horizontal section running somewhat obliquely downwards and

outwards. The caudate nucleus and the lenticular nucleus and also the internal capsule are thus rendered visible.

1. Frontal lobe.
2. Temporal lobe.
3. Occipital lobe.
4. Corpus callosum.
5, 5. Anterior horn.
6. Nucleus caudatus.
7, 9. Nucleus lentiformis.
8. Claustrum.
10. Anterior shank of internal capsule.
11. Posterior shank of internal capsule.
12. Capsula externa.
13, 15. Thalamus opticus.
14. Corpus striatum.
16. Ammonshorn.
17. Fimbria.
18, 18. Posterior horn.
19. Cerebellum.
20. Third ventricle.
21. Inferior horn.
22. Facial tract.
23. Motor tract.
24. Sensory and psycho-sensory tracts.

a, *b*. Line projected from the outer meatus through the tegmen tympani and the posterior shank of the internal capsule.

FIGURE V.

Lateral view of cerebrum and cerebellum in situ, dura and bone removed down to the roof of the meatus.

1, 1. Centre for the lower extremity.
2, 2. Centre for the upper extremity.
3, 3. Centre for facial and hypoglossal.
4, 4. Motor speech centre.
5. Island.
6, 6, 6. Amnesic speech centre.
7. Cerebellum.
I. First temporal convolution.
II. Second temporal convolution.
III. Third temporal convolution.

TWO CASES OF OTITIC BRAIN DISEASE—SINUS THROMBOSIS, AND ABSCESS.

By Dr. ROBT. E. MOSS, San Antonio, Texas.

I—*Suppurative mastoiditis complicated with sinus thrombosis—Operation—Recovery.*

Mrs. L. E., æt., twenty-seven, had measles six weeks before I saw her, and suppuration of middle ear as a complication during latter part of attack. The mastoid became involved later and the pus found its exit at lower tip of process and burrowed beneath both deep and superficial fascia causing diffuse cellulitis of the neck from mastoid to clavicle. Patient was referred to me by Dr. Frank Paschal, Aug. 14, 1894, he having seen her for the first time that day. The neck was greatly swollen on right side, fluctuating by palpation, and causing great pain all the time. The discharge from external ear very slight, the posterior superior wall so swollen that inspection of *Mt* was impossible. Hearing for watch reduced to pressure. I advised immediate operation, which was done the following day. Her temperature at time of operation was 101° F. Opened mastoid with chisel and curetted thoroughly, removing a great deal of granulation-tissue and carious bone. The hemorrhage was so profuse I had to pack with gauze. The tissues of the neck were freely opened, irrigated with hot carbolized water, and a gauze drain put in from tip of mastoid to most dependant point of pus accumulation.

Aug. 16th. Temp. 100° F., pulse 92, patient comfortable. Took off dressings, irrigated with boiled water carbolized, dried cavity, insufflated iodoform freely, packed lightly with gauze, and applied bandage.

Aug. 17th.—Temp. 99°, pulse 80.

Aug. 18th.—Temp. normal, discharge slight, appetite fairly good.

Aug. 20th.—Came to my office, no fever, wound doing nicely.

Aug. 21st. Temp. 101°, pulse 110. Complains of headache and chilly sensations, wound doing nicely.

Aug. 22d.—Temp. 103°, pulse 130. Complains bitterly of head and ear. The internal jugular vein showed marked phlebitis. Dr. Paschal saw her with me and concurred in the view that a second operation was necessary; as we evidently had a sinus thrombosis to deal with. She was sent to City Hospital and we expected to operate next day, but owing to some misunderstanding we were not permitted to do so.

I saw her again Aug. 25th, temp. 100°, pulse 90, fairly comfortable, and her condition continued about the same for ten days when she had a decided chill. Temp. 102.8°, pulse 130, great pain over lower lobe of right lung, suppressed cough, and marked crepitation on auscultation. The condition showed plainly we had a septic infarction of right lung.

Sept. 5th.—Temp. 99.5°, pulse 100.

Sept. 6th.—Temp, 101, pulse 120°. She was chloroformed, and, assisted by Drs. Paschal, Kingsley, and Fitzsimons, I exposed sigmoid sinus for one and a half inches and found it firmly thrombosed. I slit it open freely and pushed a piece of gauze into it in each direction and loosely packed the part that had been opened. The cavity was dusted with iodoform and loosely packed with gauze. I then cut down upon the internal jugular vein and put on two ligatures, cutting the vein between them. I had great difficulty in exposing the vein due to the cellulitis. Patient stood the operation nicely and had no unfavorable symptom except a second infarction in right upper lobe, anterior aspect, which caused slight elevation of temperature for three or four days. She left the hospital at the end of two weeks and came to my office to have wounds dressed.

Oct. 22d.—Wound nearly closed, no discharge at all; perforation in *Mt* healed, hearing W. $\frac{36}{40}$ She is very anæmic, spleen enlarged, slight anasarca and some ascitic fluid in abdomen.

Nov. 13th.—Wound entirely healed, patient able to do her own housework, and her general condition greatly improved.

In looking over the latest works at my command I find one case only recorded by Burnett, operated on by Keen, and two cases in Macewen's work.

II.—*Mastoid sclerosis, cerebral abscess—Operation—Death.*

Mrs. W., æt. fifty-one, came with history of acute attack of mastoiditis in October, 1893, followed by profuse discharge from external canal. She had recurring attacks at intervals of one to three months with constant deep-seated pain over mastoid and occiput. I saw her first Aug. 15, 1894. She was complaining very much of pain in ear and over occiput: she could not put back of head on pillow, nor had she been able to do so for several months on account of the pain.

The *Mt* was opaque, slightly bulging in superior posterior quadrant. Hearing W. $\frac{4}{40}$. No swelling over mastoid, but she complained of great pain when percussed with finger. Eye-ground normal except hazy outline of both discs, vision with $+.75 = \frac{15}{30}$; complains of photophobia at times. I advised mastoid operation and for immediate relief did a paracentesis and gently inflated by Politzer's method. A slight amount of fluid escaped, serous in character. I ordered a laxative, moist heat to ear and mastoid, and agreed to operate the following day; but received message saying she felt perfectly well and declined to have operation performed. She came again August 24th begging for relief. There was no perceptible change in either the ear or appearance of eyes.

Aug. 25th.—I did the mastoid operation, opening the antrum and found a few drops of fluid, some caseous material, and very marked sclerosis. Operation performed in the most strict aseptic manner.

Aug. 26th.—Temp. 98.6°, pulse 90; had restless night, slight nausea, complains of pain in ear, but says she is free from pain in back of head and can sleep on back for first time in five or six months.

Aug. 27th.—Temp. 99.5°, pulse 100; headache and pain in ears, slight discharge from external canal.

Aug. 28th.—Temp. 98°, pulse 96; tongue coated, bowels constipated; urine scant, highly acid, sp. gr. 1026, no albumen; discharge from ear and mastoid rather profuse, pain very great, refuses food.

Aug. 29th.—Temp. 98°, pulse 90; condition about same, except both discs completely blurred in outline. Her condition varied but little, the temperature remaining from a half to one degree subnormal, pulse 90° until Sept. 12th. The pain became so great I was compelled to give large doses of morphine to keep

her reasonably quiet. Pupils dilated, photophobia, papillitis quite marked, retinal vessels tortuous.

Sept. 13th.—Temp. 97.6°, pulse 86 ; had a bad night. External canal closed, slight swelling of face and lids, pupils widely dilated, photophobia very great, diffuse retinal hemorrhages in both eyes, more marked in left. Advised another operation, but it was refused.

Sept. 14th.—Temp. 97.8°, pulse 92 ; vomited during night several times ; refuses nourishment, instructed it to be given by rectum.

Sept. 15th.—Temp. 98°, pulse 90 ; restless, sighing and weeping, begs for relief and consents to operation. Assisted by Drs. Paschal and Hugh Young, I exposed sigmoid and lateral sinuses and removed the bone upward for inch and a half. There was nothing abnormal with either sinus, nor the dura. I explored each sinus and brain with hypodermic needle with negative result, then slit the dura and explored brain over middle fossa with a grooved director, but failed to get any pus. I felt positive, however, that the director had entered a cavity, yet no pus escaped. I introduced a piece of gauze into brain substance a half inch, left wound open, loosely packed with gauze, and put on bandage.

Sept. 16th.—Temp. 98.6°, pulse 96 ; slept six hours during night without any drug, slight nausea, but is able to take peptonized milk and freshly squeezed beef-juice.

Sept. 17th.—Temp. 98.6°, pulse 86 ; vomited during the night, rather restless, complains of ear, pupils dilated, but react to light. Removed dressings, wound perfectly dry.

Sept. 18th.—Temp. 98.6°, pulse 86 ; pupils normal ; had a good night, begging for solid food ; *dressing saturated with discharge*, also some cloths used to protect gown and pillow. Removed dressings and found pus escaping alongside of gauze that had been pushed into brain. I introduced a flexible bulbous-tipped probe and found the cavity at the depth of one and a half inches. The opening was enlarged and strip of gauze pushed into the cavity.

Sept. 19th, 20th, 21st.—Condition about the same, pupils normal, discharge very slight, clamorous for food, complains of pain in front of ear.

Sept. 22d, 23d, and *24th.*—Temp. normal, pulse 90 ; pain in front of ear still, and complains at times of vertigo, which is very distressing.

Sept. 25th.—Temp. 98.4°, pulse 86 ; no discharge, external canal closed, pupils dilated.

Sept. 26th.—Temp. 97.8°, pulse 90 ; pupils widely dilated, no discharge, severe headache : 3 P.M.: temp. 98.6°, pulse 92 ; pupils slightly dilated, wound discharging freely. Her condition continued about the same until Oct. 1st ; found temp. 100.5°, pulse 96 ; pupils slightly dilated ; 1.30 P.M. ; temp. 101.8°, pulse 96 ; has great difficulty in saying what she wishes to on account of not being able to use the word she wants ; after it is suggested she will then finish the sentence. There was very little change to Oct. 9th, except slight increase of fever at times.

Oct. 9th, 7.30 A.M.—Temp. 98.6°, pulse 86 ; no discharge, pupils normal, slept eight hours during night ; 7.30 P.M. : temp. 103°, pulse 112 ; restless, muttering delirium. After this her fever ran from 103° to 106°, and she died Oct. 13th. No post-mortem allowed.

The death may have been caused by the consequences of the original abscess (septic meningitis) or by a second abscess.

VERTICILLIUM GRAPHII AS THE CAUSE OF AN OBSTINATE OTITIS EXTERNA DIFFUSA.

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In looking over the literature of the subject, I fail to find any cases of otitis externa diffusa parasitica caused by verticillium graphii (Harz-Bezold) reported from anywhere in the United States, though the mycosis of diffuse external otitis has been studied by several observers in our country. A number of cases of this kind are reported by Siebenmann (Archives of Otology, vol. xviii., p. 257), who gives an account of fifty-three cases of otitis externa diffusa observed and examined as to their ætiology by Bezold. Among Bezold's fifty-three cases of otomycosis the micro-organisms found were classified as to their genus thirty-six times; among this number verticillium graphii was found seven times. Siebenmann, in the article referred to, gives the following description of this micro-organism:

" . . with a large percentage we further find in our statistical synopsis a verticillium recorded. Profs. Harz and Bezold thus call a mould which—not identical with any botanically known mould—was first described by Hassenstein and Hallier, and a year later by Steudner, and which was also found three times in the ear by Prof. Bezold as early as 1870–79. Prof. Hassenstein (*Archiv f. Ohrenhk.*, vol. iv., p. 162) gives an extensive history of a case . . . Hyphens of thallus transparent, colorless, later thick-walled, yellow to brown, septate, branched, diameter 2–3 μ. The

fruitbearers somewhat lighter, at large distance delicately septate, straighter and somewhat thinner than the mycelium. Branches in pairs, opposed to one another, frequently given off irregularly, often branched again. Spores isolated at the end of the branches, tapering towards the fruitbearers, when ripe' smoke-gray, ovoid with smooth surface (diameters 5 and 3 μ), bundle-shaped mycelium-cords, and stem-formation with normal formation of conidia very frequent."

This description answers in almost every detail to the mould I obtained in pure culture from a very obstinate case of otitis externa diffusa which came under my observation.

Clinically the case presented the following features:

Mrs. C. S., twenty-seven; born in Germany; came to the United States in 1883, presented herself for treatment October 4, 1893. Stated that she had, for the last five or six years, been frequently the subject of attacks of earache on both sides; that her mother in Germany had likewise suffered frequently from the same trouble.

Examination: The integument of the meatus auditorius externus on either side is very much swollen and reddened so that only a small part of the membranæ tympani can be inspected. The membranes, as far as seen, do not present any appreciable pathological changes; hearing distance for whispering voice six or seven metres on either side; tuning-fork tests normal. The ears were first syringed with hot sterile water, and the meatus were wiped with sterile cotton, which was dropped into test tubes containing sterile bouillon.

This bouillon, when examined twenty-four hours later, contained mould mycelia. From the culture fluid peptone-gelatine plates were made. These plates, at a temperature of 20–25° C. developed mould colonies of circular outlines, raised considerably over the surrounding surface of the culture-medium, of a grayish-white color with a slight tinge of yellow. These colonies consisted of mycelium only, no fruitbearers with spores being found. The growth was next transferred to potatoes, where it evidently found a more fertile soil for development, which found its expression in the formation of fruitbearers with spores. The mould ob-

tained answered, as above stated, to the description given of Bezold's verticillium graphii. I may add a few observations upon this micro-organism.

Evidently verticillium graphii does not find a very favorable soil on peptone-gelatine (even if this be acid in reaction). Repeatedly I could not get any cultures at all on gelatines from reasons not known to me. Never did I obtain a fruit formation on gelatine, and the mycelium formed differs from that found on a potato culture by being thinner and more transparent in its individual stems or branches. It also does not show very markedly that tinge of yellowish-brown which is found in the older hyphens on potato cultures. On the latter soil the verticillium grows more rapidly than on gelatine, and the colonies attain a larger size and are much more elevated over the surface of the culture medium. The spores are, as stated by Siebenmann, pear-shaped; they seem to be attached very loosely to the fruitbearers, because in all of my specimens examined under the microscope by far the majority of the spores had fallen off from their fruitbearer. The pear shape is often very distinct in that the spores show on one pole of the long diameter a nipple-like process; sometimes both poles show such a process. It seems that spores may divide and form two spores, as I have seen pictures under the microscope which indicate this occurrence. However, it is also possible that in these instances I only dealt with two spores which came in opposition with their nipple-like processes. As a rule the growth occurs in the following two manners:

By Fission.—The spore begins to elongate and grows in the direction of its long diameter, until the latter has attained twice or thrice the size of the short diameter. Then the granular protoplasmic contents of the elongated spore divides in the middle of the cell, and the two separated masses diverge towards the poles of the long axis, leaving a clear space in the middle. Here the cell membrane bulges somewhat outwardly, forming a ring *en relief*, as it were. Next we see a constriction which gets more and more marked, until the cell is finally completely divided in two now more or less cylindrical cells.

By Budding.—We also see that spores grow by the process of budding. After some elongation and flattening of the poles, we see on one of the latter the formation of a small nipple. It seems that the protoplasmic contents of the cell first issues a process which stimulates the cell membrane to advance in its growth in the direction prescribed by the protoplasm. This nipple elongates and gets larger in its diameter, until it reaches the size of the mother cell. The following drawings may illustrate the processes of growth as described.

The picture of the micro-organism as a whole, as seen under the microscope by the author, is almost identical with the picture given by Siebenmann in his article referred to (this picture is reproduced in the *System of Diseases of the Ear, Nose, and Throat*, Philadelphia, 1893, vol. i., p. 198). The only feature in this drawing which seems objectionable to me is the stem formation marked (*a*), which might easily convey to the observer the idea that the fruitbearers arise from the stem in a "racemose" or "umbelliferous" manner; this is never the case. The stems are always divided in an irregular, dichotomous manner, and so are the fruitbearers, which never carry more than one spore. A picture like that seen in fructifying penicillium is never seen in verticillium graphii.

After the cause of the otitis externa had been discovered, the treatment proposed by Bezold was instituted, consisting in the instillation of a 4 per cent. solution of salicylic acid in alcohol. Under this treatment the inflammation caused by the mould very soon abated, disappearing entirely after a few weeks' persistent treatment. When seen about seven months later the patient stated that she had not had another attack of earache, and that she had, in fact, not been free from earache for so long a period for the last five or six years.

THE POSSIBILITY OF OBTAINING MARKED IMPROVEMENT IN THE TREATMENT OF DEAFNESS AND SUPPOSED DEAF-MUTISM BY ACOUSTIC GYMNASTICS—A SYSTEM OF VOCAL TRAINING OF THE AUDITORY NERVE, AS ADVOCATED BY PROFESSOR URBANTSCHITSCH OF VIENNA.

By Dr. M. A. GOLDSTEIN, Saint Louis, Mo.

THE following communication is presented to the American medical profession, with full authorization and approval of Professor Urbantschitsch, from translated extracts of his monographs and from the writer's notes and personal experiences with numerous cases under Professor Urbantschitsch's special supervision.

The proposition to attempt the treatment of deaf-mutism by the influence of *aural gymnastics* (training of the auditory nerve) is by no means new.

Beck (*Ohrenheilkunde*, 1827, page 73) notes the recommendation of Bewus in 1743 to treat deafness by sound conduction. Itard (*Traité des Malad. de l' Oreille*, 1821, Paris, t. ii., page 446) and Toynbee (*Diseases of the Ear*, 1860) report a number of cases successfully treated by similar methods. Phillippe (*Journal de Méd.*, Bordeaux, 1846, page 254) strongly advises the use of an ear-trumpet, a method at present much in vogue among French aurists.

Browne (British Medical Ass'n, Cork, 1879) and Keown (*Arch. f. Ohrenheilk.*, vol xvi., page 229) have also reported improvements in hearing, the result of aural gymnastics. Urbantschitsch (*Arch. f. Physiologie*, Pflügers, 1883, page 129) has recorded numerous improvements in auditory per-

ception casually observed in the examination of healthy and diseased ears. Eitelberg (*Zeitschrift f. Ohrenheilk.*, 1883, vol. xii., page 258) has instituted more detailed research in similar cases.

Notwithstanding all these observations and the thoroughly instructive investigations of Itard and Toynbee, the attempt to adopt a systematic treatment influencing hearing for the totally or partially deaf has been sadly neglected, and has gained but little recognition, especially from aurists. Even the celebrated Ménière (*Gazette Méd. de Paris*, 1880, No. 50 and 51), one of the most distinguished of French aurists, seems to have added a discouraging opinion, designating the results of the application of aural gymnastics and other methods of training of deaf-mutes, undertaken by the Paris Deaf-mute Institute, as illusionary and transient.

"Several years ago," writes Professor Urbantschitsch, "I obtained by systematic aural gymnastics surprising results in the case of a deaf-mute boy presented to me for treatment; primarily the patient was able to hear only loudly spoken vowels and single syllables; after one year's treatment he was able to understand complete sentences, spoken in a moderately loud voice, and finally the ordinary methods of oral instruction were made possible by the steady improvement of the patient."

The past year Professor Urbantschitsch has instituted a daily class in "aural gymnastics" for the instruction of a large number of deaf-mutes, and has attained results of a most gratifying character. This group of children, who, in previous examinations, had been declared hopelessly deaf and ready for entrance to deaf-mute asylums, have, since the adoption of methodical "aural gymnastics," recovered, not only their capacity of hearing *vowels*, but, in the course of one year's practice, have been able to hear and repeat *whole sentences*. Many of these cases at the first examination gave indications of absolute deafness, demonstrable by tuning-forks of different pitch through air- and bone-conduction, and by most intense sounds applied to the ears; even the use of ear-trumpets, tubes, and similar devices developed no sound perception.

The writer has personally seen many of these cases, and noted the marked improvement from month to month.

The surprising fact that it is possible for an individual, apparently completely deaf, to develop, by systematic training, not only *perception*, but also *differentiation* of sound, is to be considered only from the one standpoint that said individual was not really deaf, but lacked the power of properly interpreting acoustic impressions.

Such a system of methodical, accurately conducted "aural gymnastics," as herein indicated, can be of decided value to seriously affected hearing, by producing: 1st. A *differentiation* and *proper perception* of aural impressions; 2d. *A stimulation in sound intensity*, with a gradually *increasing acuteness* in aural perception.

The manner of conducting this new system is as follows:

By way of illustration a case of complete deafness or deaf-mutism is presented. In a loud voice, close to the patient's ear, a vowel is sounded; the patient receives either *no impression* or indicates a *very indefinite sound perception;* this sound perception, if present, may be the same for all vowels, thus, *a-e-i-o-u* would all be heard as *a* or *e*, as the case may be. The exercise is begun by indicating to the patient the vowels to be used, as, for example, *a* (as in *father*), *e* (as in *eel*). It is most interesting to observe, how, by several minutes' use of these two vowels, called into the ear in a steady, loud voice, the patient often arrives at a differentiation of sound; by no means a complete differentiation, yet the sounding of *a* produces a different impression than *e*. In some cases several minutes suffice to reach such a primary differentiation; in others, a number of sittings are required. Gradually, as expeditiously as each individual case indicates, the other vowels should be brought into use. The plainest, simplest sounds of the vowels should be used, viz.: *a* (as in *father*), *a* (as in *late*), *e* (as in *eel*), *o* (as in *hope*), *u* (as in *flute*). Following the vowels, the consonants should be combined in monosyllables as: *lo*, *may*, *do*, *ba*, *he*, etc. Consonants heard with difficulty and easily confusable, as: *b* and *p*, *t* and *d*, *g* and *k*, etc., should receive extra attention and be diligently practised. To add interest to these exercises for the patient,

it is well to use, instead of mere sounds, words of single syllables, as: *ball, pall—to, do—gate, Kate*, etc.

Should the patient persist in repeating a wrongly heard sound or word, it is suggested to give him, first the *right* and then the *wrong* sound, until the differentiation becomes apparent to him.

A very interesting comparison is that of *perception* and *conception* of sound impressions, as ascertained in the course of this method.

A deaf-mute, who, through this system, hears a word for the first time and repeats it correctly, scarcely comprehends the meaning of the word. A case is cited of a deaf-mute girl, who, during one of these acoustic practices, was given the word *Anna*, the name of one of her sisters. This word was plainly heard and correctly repeated, yet when the meaning of the word was asked, the patient was unable to associate the idea of her sister's name with the word heard. When the explanation was given, the young girl's surprise was great, and from that moment a rapid improvement was noted, as the patient made every effort to combine the spoken word with the idea implied.

It is recommended that, in this practice, *words without meaning* should *also* be used, to determine whether or not the patient really hears the words used, and is not exercising the power of combination of familiar sounds.

As the progress of each individual case indicates, *whole sentences* should follow the use of *vowels, consonants*, and *words*. Also the *hearing distance should be gradually increased.*

As the patient becomes accustomed to the practice, the speaker's *lip-movements should no longer be observed*, in order that the results gained may be those of the "aural gymnastics" *exclusively;* without the auxiliary aid of the eye. The case of a boy is cited, who, at the beginning, could not hear a single vowel when loudly spoken in his ear at closest range; in six months' practice he could hear and repeat accurately whole sentences, with the speaker at a distance of five feet, and without the aid of the lip-reading system so much in vogue in the deaf-mute teaching institutions of Europe. Many similar cases are recorded.

Regarding the length of time of each sitting in this practice, it is important to know that a few minutes often suffice to tire such patients' hearing power completely, *too prolonged a sitting* sometimes temporarily causing a condition similar to nervous asthenopia. It is therefore recommended that a limit of time in carrying out these "aural gymnastics" be always observed. At the beginning, sittings from ten to fifteen minutes, repeated two or three times daily, suffice; gradually increase the length of each sitting to one half hour and one hour, to suit the requirements of each case. Scarcely ever should a sitting be prolonged beyond one hour.

If an *exhausted condition* of the patient's hearing power is observed, the exercises should be discontinued for a week or ten days.

The *pitch and intensity of voice* used must be modified as each case demands. The use of ear-trumpets to intensify sound should be very limited, as a sensitive aural perceptive apparatus may be easily damaged by harsh or sharp sounds. In some cases where the hearing condition is very bad, the ear-trumpet may be cautiously used in this practice with advantage. Generally, however, a long-sounded vowel or word, given in a moderately loud and clear voice, close to the ear of the patient, and in the axis of the auditory canal, with care used in articulating very distinctly, will suffice.

Of the ultimate results of the application of this system we can scarcely form a complete estimate, as the range of improvement in many instances has proven almost unlimited. Only through long experience, with persistent and patient practice, can an ultimatum be reached. The advantages, however, are self-evident, and require but a short reference. Even the benefits acquired by *vowel hearing*, in modulating and regulating speech, are all-important. The gradual progression from vowel hearing to consonants, words, and finally the comprehension of entire sentences, is only possible by a diligent application of "aural gymnastics."

Beneficial results from the use of this system are equally distributed, either in cases of *congenital or acquired deafness.* Professor Urbantschitsch reports excellent success in cases

of acquired deafness, sequelæ of cerebro-spinal meningitis, typhoid fever, scarlatina, measles, traumatism, and in one case of deafness, the result of fright, the condition existing for twenty-two years.

Age seems to offer no obstacle to success. In the deaf-mute asylums of Austria these suggestions of Professor Urbantschitsch have been given every consideration, and the practical tests have yielded most gratifying results. For nearly one year these exercises have been combined with the regular system of instruction in the Oberdoebling Deaf-mute Institute of Vienna, and the progress of the pupils, as indicated by recent tabulated reports, has been remarkable.

A number of these pupils, to whom the special instruction had been given, were presented before the Society of Physicians, in Vienna, April 27th last, and the fact that these congenitally deaf pupils could hear the speaker at distances varying from several inches to ten feet, without the aid of lip-reading or signs, was in itself the most brilliant testimony of success.

Such gratifying results, reached while this system is still in its infancy, and in such comparatively short time, speak volumes. The introduction of a system, which gives promise of so beneficial an aid in training and instruction of deaf-mutes, should be granted a fair and patient trial in every deaf-mute institution and by every aural specialist in America. The Volta Bureau of Washington has, as I understand, received Professor Urbantschitsch's communications of this system, and is stimulating investigations as to its efficiency.

Every medical man in general, and aurists in particular, should give the system of instruction pursued in our various institutions for the deaf and dumb a careful study, so as to be able to recommend understandingly to the parents and friends of these unfortunate members of society the course of training to be pursued, best calculated to result in greatest advancement.

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REPORT OF THE PROCEEDINGS OF THE THIRD MEETING OF THE GERMAN OTOLOGICAL SOCIETY IN BONN, MAY 12TH AND 13TH, 1894.

Translated by DR. W. A. HOLDEN.

FIRST SESSION, MORNING OF MAY 12TH.

Chairman : Dr. KESSEL of Jena.

SIEBENMANN, Basle : *On the first appearance of the auditory ossicles and the tubo-tympanic space in man.*

Examination of human embryos of the 3d to the 8th week showed that the blastem of the cartilaginous labyrinth capsule appears in the 4th week, that of the annulus stapedialis in the 5th, and that of the malleus and incus in the 6th week. Even at the earliest stage the blastem of the annulus stapedialis lies near the labyrinth capsule as well as the dorsal end of the fore-cartilage of the second pharyngeal arch. The stapes is not of double origin. The space corresponding to the medial wall of the tympanic cavity exists at the first month as an undifferentiated portion of the pharyngeal cleft, a separation of the tubo-tympanic space taking place in the first half of the second month by the nearer approach to each other of the dorsal and ventral wall of the pharyngeal cleft and by the advancement of a solid mesodermic layer, closing the tympanic cavity below. The paper was illustrated by drawings and preparations.

BARTH, Marburg : *Remarks on the annular ligament of the stapes, and presentation of a preparation in which it is replaced by a true joint.*

The fibres of the annular ligament are continued some distance into the bone surrounding the fenestra as well as into the bone of the foot-plate of the stapes, running here almost perpendicular to

the surface of the bone. The path which they follow in the bone is often three or four times as long as the transverse section of the bundle itself, this relation securing a very extensive firm attachment to the stapes. In a preparation from a guinea-pig it was shown how the stapes and the wall of the fenestra lie opposite each other almost in the form of a ball-and-socket joint with the surfaces of contact flattened. The joint space is bounded toward the vestibule and middle ear by a capsular membrane. The articulating surfaces are covered with a layer of flat endothelium.

BEZOLD, Munich : *Another case of bilateral anchylosis of the stapes diagnosticated in life, with autopsy, and manometric and histological examination.*—(To appear in full later.)

BEZOLD, Munich : *The hearing power in double congenital atresia of the external auditory canal with rudimentary auricle.*—(To appear later.)

DENKER, Hagen : *Presentation of a case of primary epithelial carcinoma of the cartilaginous and membranous auditory canal and auricle.*—(To appear later.)

Discussion.—BOCKEMÄHLE, of Münster, spoke of a case of cancer of the auricle operated on three years previously, with no recurrence in two years and a half. LEMCKE, of Rostock, reported a case of a small carcinoma scraped off five years previously with no recurrence. BARTH, of Marburg, recollected a case in which there were changes suggesting epithelioma, in both ears, which disappeared with the use of iodoform salve. JANSEN, of Berlin, had no recurrence in a case of carcinoma operated two years previously.

REINHARD, Duisburg : *The treatment of cholesteatoma of the temporal bone by a permanent opening behind the ear.*

The author stated that in cases of small uncomplicated cholesteatoma it sufficed to remove the osseous portion and the lateral wall of the antrum, securing a permanent opening in the posterior wall of the auditory canal, by the cuticularization of the cavity so obtained. He believed, however, that in the case of larger cholesteatomata, with caries and necrosis, it was best to secure a permanent opening through the auditory canal as well as through the lateral wall. In cases operated in this manner he had never seen a recurrence of the otorrhœa. The author sought to secure permanency of the opening behind the ear by carrying in a triangular skin flap from the scalp in Schwartze's manner, or by Thiersch grafts, or by taking a flap from the posterior surface of the concha,

thus preventing the later growth of hair. The treatment lasted from two to nine months in the twenty-five cases of cholesteatoma operated by the author, thirteen of which were permanently cured, three died, four had recurrence of the disease, and five were still under treatment.

Discussion.—HARTMANN, of Berlin, in cases of extensive cholesteatomatous formation, when the cholesteatoma came near the surface, believed the maintenance of a permanent opening indispensable; in cases of smaller cholesteatoma, one need only remove the anterior wall of the antrum and lay the attic open.

JANSEN, of Berlin, reported that in the Berlin clinic over 100 cases had been cured with a permanent opening, without often resorting to Schwartze's flaps and but rarely to any plastic procedure, though in some cases by the combination of Stacke's plastic method with a flap from the posterior surface of the auricle. The permanent opening does not prevent the recurrence of membrane formation or of suppuration. Treatment through the cavity of the wound is to be preferred, except in rare cases. Cholesteatoma occurs particularly in tuberculous individuals, and is frequently of tuberculous nature.

KRETSCHMANN, of Magdeburg, stated that cholesteatoma recurred almost without exception. The question whether a permanent opening should be made behind the ear could not yet be positively answered. When this is to be secured, the opening should be quickly covered with skin. The speaker preferred the flap operation, particularly that suggested by him, but believed that skin should be transplanted only on to bone that had been operated upon.

SIEBENMANN, of Basle, remarked that the transplantation of Thiersch grafts shortened the period of treatment, and that it could be performed in cases in which the small size of the cavity prevented the performance of Schwartze's flap operation.

HANSBERG, of Dortmund, believed that the formation of a permanent opening might almost without exception be dispensed with. The chief indication is the radical exposure of the cavity of the middle ear. The speaker permits the mastoid wound to close after five or six weeks, and carries on his treatment through the auditory canal.

NOLTENIUS, of Bremen, considers every secretion in the cavity, whether moist or dry, a recurrence. In this sense, there is no cholesteatoma without recurrence.

In closing the discussion, REINHARD stated that by recurrence

was understood the re-establishment of suppuration. This is best prevented by keeping patulous not only the opening in the canal, but also that in the lateral wall of the mastoid. He could not share the optimism of Hansberg and Noltenius.

SECOND SESSION, AFTERNOON OF MAY 12TH.

Chairman : Dr. KUHN, of Strassburg.

HANSBERG, Dortmund : *Demonstration of plaster casts of the antrum of Highmore opened by operation, and of antrum obturators.*

The speaker showed a number of plaster casts of the antrum of Highmore, after it had been chiselled open, and of hard rubber obturators designed to close the operative opening. These obturators are attached to a palatal plate by a movable rubber joint, so that no pressure is made upon the alveolar process. The obturator, which may be easily removed and replaced, is to be worn as long as suppuration in the antrum continues.

BÜRKNER, Göttingen : *Report on the treatment of affections of the tube.*

The speaker called attention to the importance of catheterization when there was swelling or mucous secretion in the tube, and gave it preference over Politzer's procedure, which latter is nevertheless of value in simple cases. The fear of causing infection of the middle ear in cases of acute naso-pharyngeal or tubal affections is an exaggerated one, the neglect to inflate the middle ear often working more harm than the carrying of micro-organisms into the tympanic cavity, which may occur nevertheless every time the patient sneezes. The speaker then spoke of the various methods of catheterization to be used when there is obstruction in the nose, but considered special instruments unnecessary. The important measure in all simple tubal affections is gargling ; injections through the catheter are also recommended, but they should not be chemically irritating. The use of the bougie in the tube should not be carried to excess, this being indicated only when catheterization causes no improvement. The simultaneous employment of the bougie and of medicamentous treatment seldom gives good results, although the vibration massage by means of the bougie, as recommended by Urbantschitsch, is sometimes indicated. This method is, however, often painful, while the external massage, as recommended by Politzer, is not.

The speaker then referred briefly to the methods of treatment when there is atresia of the tube (electrolysis, excision of the drum-membrane and malleus), and when there is abnormal patulousness of the tube, and the important measures to be used when there are abnormal conditions in the nose and naso-pharynx (ulcerative processes, synechiæ, adenoid vegetations, and hypertrophy of the turbinates). He advised caution in the use of the galvano-cautery ; when superficial effects are wished, escharotics, such as trichlor-acetic acid, are preferable.

Discussion.—BEZOLD, of Munich, agreed with the speaker that even in acute tubal affections the air douche should be used, and that the catheter is often preferable to Politzer's method of inflation even in children. Bezold in his numerous autopsies has never found atresia of the tube. The use of the bougie should be restricted.

BRESGEN, of Frankfort-on-the-Main, earnestly recommended the removal of nasal obstructions which prevented catheterization, and greatly preferred chromic to trichlor-acetic acid.

SIEBENMANN, of Basle, stated that nasal obstruction had no etiological connection with tubal catarrh, since normal hearing and a normal position of the drum-membrane might be found with closure of the choanæ. Apart from that produced by adenoid vegetations he had never found stenosis at autopsies.

BARTH, of Marburg, said that the more carefully he treated the nasal affection, the less he used the air douche for therapeutic purposes.

FISCHENICH, of Wiesbaden, spoke of redness and swelling of the turbinate bodies and their connection with swelling of the tubes. The latter is often cured by treatment of the nose, while inflation is of no benefit. When the swelling in the nose is not reduced by cocaine, he recommends the use of the galvano-cautery or snare ; other cases he treats with trichlor-acetic acid.

HARTMANN, of Berlin, uses inflation so long as he obtains improvement. The value of tubal injections is not to be underestimated, and cocaine acts favorably. The operative removal of nasal obstructions may often be dispensed with if thin, short-beaked catheters are used.

LEMCKE, Rostock : *On acute caries and necrosis of the temporal bone after influenza.*

Among sixty-four cases of ear trouble in consequence of influenza, there were eleven in which opening of the mastoid was re-

quired, and four of these showed acute caries and necrosis. One case was that of a boy of five, the others were adults. In two cases the dura was exposed in the operation. The author compared this affection of the temporal bone after influenza, to the bone affection in acute osteomyelitis. He regarded his observations as a support of the idea that there is an influenza form of otitis, and that in some epidemics this not rarely affects the bone primarily or more severely, and compared with this bone process that threatens life, the changes in the middle ear are of little importance.

Discussion.—BARTH, of Marburg, called attention to the variation in different epidemics of influenza in respect to aural complications. In one epidemic he observed masses of unusually tenacious secretion in the middle ear; in another, violent middle-ear inflammations which were cured without perforation in a relatively short time.

JANSEN, Berlin, spoke of the unusually large number of mastoid operations which he had performed at the time of an outbreak of influenza. He, however, had never seen a condition resembling osteomyelitis.

EULENSTEIN, of Frankfort-on-the-Main, in the last epidemic, saw extensive diseased foci just beneath the cortex, which developed rapidly and without marked symptoms in the middle ear. He is of the opinion that in such cases the disease is often a primary ostitis. The diagnosis of this mastoid disease, which runs its course almost without a symptom, is facilitated by percussion of the mastoid process.

HARTMANN, of Berlin, stated that influenza bacilli mostly associated with other bacteria were found in 10 per cent. of the infants in the institution for infectious diseases in Berlin.

FISCHENICH, of Wiesbaden, agreed with Barth that influenza epidemics vary greatly in respect to the aural complications. In an earlier epidemic he frequently observed severe pain in the mastoid without caries, while in the last epidemic he saw many dangerous cases, some of which were similar to those described by Lemcke.

KOERNER, of Frankfort-on-the-Main, agreed with Eulenstein that many of the cases of mastoid disease following influenza do not originate in the tympanic cavity, but affect it secondarily. The process is mostly localized in the diploic bone; the pneumatic cavities and the tympanic cavity being only affected later. In considering the development of acute mastoid disease, the part

played by the pneumatic cavities has been overrated, and that by the diploë not sufficiently recognized.

LEMCKE said in conclusion that the cases of mastoid caries and necrosis running a violent course had been compared to osteomyelitis only as regards their clinical aspect and not their etiology. The discussion had shown, however, that caries and necrosis following influenza were not rare.

KOERNER, Frankfort-on-the-Main: *On plastic operations on the meatus.* The cuticularization of a large operative cavity in the bone presents many difficulties. The speaker had therefore endeavored to obtain union of the cutaneous incision made for drawing the auricle forward and detaching the meatus, with a single dressing, and to get a permanently widened and straight canal, and to hasten cuticularization. For this purpose he makes a skin flap, with its base at the auricle, consisting of a portion of the cymba conchæ and the entire posterior portion of the cartilaginous membranous meatus. The dressing is usually left 10 days, in which time the cutaneous incision behind the auricle is completely healed. In three cases treated by the author in this manner, the cavity became lined with skin on an average in 72 days, while the healing after Stacke's operation, according to the experience in the Halle clinic, required 120 days on the average.

THIRD SESSION, SUNDAY MORNING MAY 13TH.

KUHN opened the session, and read a telegram of greeting from Professor Politzer.

Before passing to the programme of the day, WALL, of Bonn, showed two patients operated upon by Professor Witzel by the method which they had employed in treating acute mastoid abscess and chronic mastoid affections. In cases of acute abscess the entire mastoid is laid bare and opened with a chisel from the tip upward and healing by first intention is often obtained. In chronic cases the opening is made posteriorly, and the fresh wound covered with Thiersch flaps.

WALB, Bonn: *Conservative or radical?*

The speaker stated that, notwithstanding the great progress in aural surgery, it was not right to operate in every case of chronic otorrhœa. That the conservative method might give good results was shown by the great number of cases cured previously without operation. Even after operation there may be recurrence of the

suppuration. Schwartze's relatively conservative mastoid operation, which preserved the function to the greatest extent, is indicated in many cases.

KUHN, of Strassburg, spoke of a case of acquired atresia of the canal arising in a girl of fifteen, from a blister continued for a year. The excessive distortion and the contraction of the opening were relieved by the removal of triangular segments from the cartilage of the auricle.

JANSEN, of Berlin, by means of a model, demonstrated a plastic procedure for operating on the canal by means of the transplantation of pedunculated skin flaps from the mastoid region to the posterior wall of the canal, and from the posterior surface of the auricle to the anterior wall of the canal after excision of the cicatricial and swollen tissue. This operation was made twice in 1891 with permanent effect.

KUHN, of Strassburg, reported a case of *myxo-sarcoma* of the *tympanic cavity* in an infant. In spite of repeated extirpation of the new growth, the patient died of marasmus after a few months.

HARTMANN, Berlin: *Middle-ear inflammation in young infants as observed in the Institution for Infectious Diseases in Berlin.*

The results of the examination of 47 cases were as follows:

1. The observation that at the autopsies of infants middle-ear inflammation is found in 75 per cent. is confirmed by the examination of living infants.

2. The middle-ear inflammation may be detected almost without exception by otoscopic examination.

3. The symptoms of middle-ear inflammation are restlessness, increase in temperature, and loss of weight. These symptoms are sometimes wanting.

4. Middle-ear inflammation is frequently complicated with broncho-pneumonic processes, both probably being due to the same cause (aspiration).

5. Death may result from a progressive atrophy in consequence of middle-ear inflammation, or the micro-organisms may pass into the cranial cavity and cause meningitis, or into the blood and cause septicæmia.

6. Middle-ear inflammation in young infants must be treated.

SIEBENMANN, of Basle, finds in Hartmann's observations a support for the view that a number at least of the middle-ear inflammations which develop with infectious diseases are not due to

infection from the pharynx, but are to be considered a symptom of the underlying infectious disease, primarily located in the ear.

KESSEL, Jena : *Report on anterior tenotomy, and mobilization and extraction of the stapes.*

The speaker endeavored to show from clinical experience and the results of operations that success can be obtained only when the acoustic nervous apparatus is intact. The preservation of the nerves is therefore the aim of the functional treatment. Anterior tenotomy of the drum membrane, the nerves being healthy and the stapes mobile, does not cause any marked disturbance of accommodation, and an acuteness of hearing is preserved of 25 *m* for the whisper. Removal of the drum-membrane with the malleus and incus secures an acuteness of hearing of 10 *m* for the whisper, when the tympanic cavity has no particular changes, the stapes is mobile, and the stapedius muscle normal in function. By removal of the stapes under favorable circumstances an acuteness of hearing of 8 *m* for the whisper is obtained, but the difference in labyrinthine pressure causes disturbance, and requires an apparatus which will replace the mechanical middle-ear apparatus as far as possible and regulate the labyrinthine pressure.

Discussion.—BEZOLD, of Munich, thought the hearing power obtained by the speaker after removal of the stapes excessively high, and inquired whether he had found symptoms of giddiness.

STEINBRÜGGE, Giessen : *Demonstration of preparations from a congenital deformity.*

The preparation, from a man of fifty-four, lacked the drum-membrane, the tympanic cavity, and the antrum ; the auricle was wrinkled. The membranous labyrinth and the nerves, with the exception of a small portion in the internal meatus and modiolus, showed no changes. The labyrinth capsule was sclerotic, the Fallopian canal was displaced forward, the jugular fossa was narrowed, and the axis of the cochlea shortened.

KOERNER, Frankfort-on-the-Main : *The latest progress in the treatment of otitic brain disease.*

Of the cases operated without ligation of the jugular, 43 per cent. are cured ; of those with ligation of the jugular after clearing out the sinus, 56 per cent. ; in cases in which the jugular is previously ligated, recovery occurs in 69 per cent.

GUYE, Amsterdam : *A case of pachymeningitis externa ex otitide cured by trephining.* To appear later.

JOËL, Gotha: *A contribution to cerebral surgery.*

Two months and a half after the opening of the mastoid, and the opening of a gravitation abscess, in a young man, cerebral symptoms developed. The dura was incised, and an opening made into the brain, with the discharge of fetid pus. The case recovered in six months.

In a boy of eleven, in whom the malleus had been removed and the osseous portion of the outer wall of the tympanic cavity chiselled away, cerebral symptoms developed two months later. The mastoid and tympanic cavity were freely opened, the squamous portion chiselled away above and anterior to the antrum, and the dura removed from the tegmen. The dura presented in the cavity under great pressure, and was incised, but no pus was found. In the course of the after-treatment a cerebral prolapse was cut off, with transient aphasia. Recovery in eleven months. In the opinion of the speaker it was not a case of purulent leptomeningitis.

HANSBERG, Dortmund: *A contribution to the question of the operation for otitic cerebellar abscess.*

A boy of fourteen, suffering from otorrhœa since his sixth year. Swelling of the mastoid, chills. Diagnosis: sinus thrombosis. March 15, 1894, opening of the mastoid, which was filled with putrid pus. A defect in the sigmoid sulcus. Extensive removal of the latter and of the entire posterior portion of the mastoid internal to the outer semicircular canal, and removal of a portion of the skull above the transverse sinus. A cavity in the brain the size of a pigeon's egg, with a fistula. When the dressing was changed on the fourth day a second abscess was found higher up and opened. Death April 14th.

At the autopsy an abscess was found in the posterior fossa, which involved the temporal lobe and not the cerebellum.

The author spoke of the difficulty in diagnosing cerebellar abscess, and advised for its treatment the extensive opening of the mastoid and laying bare the cerebellum.

REINHARD, of Duisburg, reported a case of sinus phlebitis of otitic origin cured by extensive chiselling of the mastoid and opening of the sinus.

JANSEN, Berlin: *Experiences with sinus thrombosis in Lucae's clinic during the year 1893.*

Twelve cases were seen, in two suppuration in the bulb only, in one thrombosis of the cavernous and superior petrosal sinuses.

In the nine other cases the transverse sinus was involved, six times together with the jugular and twice with the cavernous sinus. The author thought from these statistics that it might be possible by early and energetic operative procedures to limit the thrombosis to the transverse sinus or to have only an isolated thrombosis of the bulb of the jugular to deal with. The chief dangers in sinus thrombosis are metastases in the lungs, and purulent arachnitis, but these vary in frequency according to the sinus affected. In cases of jugular thrombosis, pyæmia and metastases occur in 76.5 per cent., in transverse-sinus thrombosis in 35.5 per cent., in inferior-petrosal-sinus thrombosis in 30 per cent., in cavernous-sinus thrombosis not at all. Pyæmia through osteo-phlebitis without involvement of a large portion of the vein is, according to the author's experience, very rare. When pyæmia persists after a mastoid operation, thrombosis of a large portion of a vein should be suspected. In pure sinus thrombosis without degeneration, symptoms may be completely wanting. The most important symptoms are pyæmic fever with chills and metastases, optic neuritis, signs of meningeal irritation, and signs on the part of the jugular veins. Of particular importance is the abscess outside the sinus, whose early diagnosis though difficult is of great practical value, as by emptying it the formation or the purulent degeneration of a thrombus may be prevented. The speaker added some remarks on the operation, taking the standpoint that thrombosis limited to the sinus should be operated upon only in the sinus.

REINHARD, Duisburg: *Observations on cerebral complications after otorrhœa.*

(a) Circumscribed cerebral tuberculosis, diffuse arachnitis following perforating pachymeningitis in cholesteatoma.

(b) A cured case of circumscribed purulent pachy-lepto-meningitis on the inferior surface of the left temporal lobe. Division of the diseased membranes; transient optic aphasia.

HARTMANN, Berlin: *Some means for the destruction and removal of tumors in the naso-pharyngeal cavity.*

1. A galvano-cautery snare with detachable handle.
2. Resection of the inferior turbinated body.
3. A self-retaining palate retractor.

Demonstration of photographic wall charts, enlarged from photographs from Dr. Hartmann's collection.

SIEBENMANN, of Basle, showed an atlas of the labyrinthine vessels and a dry-corrosion preparation of the temporal bone.

REPORT ON THE PROGRESS OF OTOLOGY DURING THE FIRST HALF OF THE YEAR 1894.

I.—NORMAL AND PATHOLOGICAL ANATOMY, HISTOLOGY, AND PHYSIOLOGY OF THE EAR AND NASO-PHARYNX.

By Prof. AD. BARTH, Marburg.

Translated by Dr. A. Duane, New York.

A.—ANATOMY.

a.—ORGAN OF HEARING.

1. Rohrer, F. Cases of congenital "coloboma lobuli auriculæ." *Arch. f. Anat. u. Physiol., Anat. Abth.*, p. 148, 1894.

2. Rohrer, F. Anomalies of formation of the auricle. (Report of the 65th meeting of the Society of German Scientists and Physicians, held at Nürnberg.) *Wien. med. Wochenschr.*, No. 1, 1894.

3. Manasse, P., Strassburg. On granulation-tumors containing giant-cells produced by foreign bodies. (One plate.) *Virchow's Archiv*, vol. cxxxvi., 1894.

4. Haug (Munich). Contribution to the clinical history and microscopical anatomy of the new growths of the external and middle ear. (Two plates.) *Arch. f. Ohrenheilk.*, vol. xxxvi., p. 170.

5. Peter. The Eustachian tubes and their appendages in the mammalia. *Arch. f. mikroskop. Anat.*, vol. xliii., part 2.

6. Ludwig, C. The path of the blood-current through the vestibule and the semicircular canals of man. After observations by O. Eichler made in the Physiological Institute in Leipzic.

Transactions of the Royal Scientific Society of Saxony (Mathematico-physical Section), 1894, vol. xxi., No. 1.

7. SCHÄFER, K. L. On the embryology of the semicircular canals. *Naturw. Wochenschr.*, vol. ix., No. 21.

8. VON LENHOSSEK, M. (Würzburg). Contributions to the histology of the nervous system and sensory organs. Part 1. The termination of the nerves in the maculæ and cristæ acusticæ. Bergmann (Wiesbaden), 1894.

9. NIEMAK, J. Maculæ and cristæ acusticæ examined by Ehrlich's methylene-blue method. *Anat. Hefte*, vol. i., part 5.

10. DUPUIS, A. Corti's membrane. A contribution to the anatomy of the internal ear. (Two plates.) From the Otiatric Polyclinic in Marburg. Inaugural Dissertation; also *Anat. Hefte*, vol. iii., part 3.

11. CANNIEN, A. Researches upon the roots, branches, and ganglia of the auditory nerve. *Rev. de laryngol.*, etc., Nos. 7 and 8, 1894.

12. BUMM, A. Experimental investigations with regard to the corpus trapezoides and the auditory nerve of the cat. Paper in celebration of the 150th anniversary of the founding of the University of Erlangen. Wiesbaden, 1893.

13. KIRILZEW. A further communication (No. 5) with regard to our knowledge of the central course of the auditory nerve. *Neurol. Centralbl.*, No. 5, 1894.

14. OSTMANN. Upon the dependence of the shape of the external auditory canal upon the shape of the skull. *Monatsschr. f. Ohrenheilk.*, No. 3, 1893.

1. ROHRER describes and figures six particularly interesting cases of congenital fissure of the lobule.

2. ROHRER figures sixteen cases of abnormally formed auricles illustrating the chief types which the anomalies of shape assume. Even in the mentally sound such anomalies are found in nearly 30 per cent. of all cases observed, and it cannot be denied that in those suffering from mental disorders and in criminals they are still more frequent. For further particulars the reader must refer to the report of the society's proceedings.

3. MANASSE publishes nine cases of granulation tumors in the middle ear, which had no connection either with tuberculosis or syphilis. In all, giant-cells were found which were connected in some way with clumps of epidermis or with cholesterin crystals.

They accordingly belong to the class of foreign-body giant-cells. They are regarded as arising from the endothelium of the lymph-vessels. It appears that in these cases the lymph-passages opened by a free orifice upon the surface of the granulation tissue. Manasse has succeeded in producing foreign-body giant-cells experimentally in dogs.

4. HAUG describes a series of anatomical preparations obtained in his own practice, and illustrating a variety of tumors found in the external ear.

6. EICHLER, who so unfortunately for science died prematurely, has left in continuation of his former work a set of drawings, which are published by LUDWIG, with a brief explanatory text. Without attempting to reproduce the particulars as to the vascular distribution, which Eichler has demonstrated, we adduce simply one of the conclusions drawn from them by Ludwig. This is that, owing to greater vascularity, the exchange of matter is more pronounced in the endolymph than in the perilymph, and the influence of similar differences in the circulation is manifest also in other parts of the labyrinth and cochlea.

7. SCHÄFER from observations upon the tadpole confirms the statement of Böttcher and Krause that the semicircular canals are developed by formation of pouches and folds. The vertical canals develop from a single common pouch. The formation of the ampullæ takes place at the same time as that of the semicircular canals. The cristæ acusticæ can be recognized very early in the form of an epithelial thickening.

8. By using Golgi's method of staining, as modified by Cajal, LENHOSSEK proved that the fibres of the auditory nerve always end in the sensory epithelium of the auditory organ in free branches, and that the relation of the terminal fibres to the hair-cells is always one of simple contact. Starting from the ganglion-cells of the auditory nerve, the fibres in the first stages of their development grow in two directions—towards the brain and towards the terminal nervous apparatus. Each nerve fibre is not simply connected with one hair-cell, but by undergoing division is in relation with a whole set of cells.

9. NIEMAK found that in the frog's ear the nerve fibres, after escaping from the basilar membrane, form by repeated division a subepithelial network and afterwards a sieve-like intraepthelial plexus, often consisting of several layers. From this latter arise two sets of fibres : one set ending free, the other connected with

one or more of the lower hair-cells. There seems to be a sort of intermediate substance, which effects the communication between the nerve and the cell, so that there is no continuity, nor even a direct contiguity, between the two. The idea that there is an envelope of very minute fibrillæ surrounding the hair-cells must almost certainly be discarded. In Mammalia the nerves, on passing through the basilar membrane, form a network of fibres, with very large meshes and occasional thickenings at the points of intersection. From the network arise filaments which do not show a fibrillary composition, but which consist of uniformly fine or coarse granules. Each of these filaments seems, in the more central portions, to supply only one or two, but in the marginal region several cells, and in the latter situation, consequently, is branched and assumes a shape like that of a stag's antlers. Into the cup-shaped granular masses thus formed the hair-cell fits. The basal network unites the separate terminal apparatuses into a single physiological whole.

10. DUPUIS shows that three zones are distinguishable in Corti's membrane, and describes each of them minutely. The following are the important facts: Upon the lower surface of the innermost zone is found a network whose meshes are large and whose appearance varies much in different species of animals. It should probably be regarded as formed of a cement-substance. The boundary line between the first and second zones is found only in hardened preparations, and must hence be considered as an artificial product. Löwenberg's network, however, can be isolated and must be regarded as the third zone. The position of the membrane can be only approximately determined. The first zone is attached to the labium vestibulare. The outer part of the second zone probably rests upon Corti's organ, and by exerting a certain degree of tension influences the position of the latter. The third zone, consisting of a thin network, lies upon Hensen's and Claudius's cells, and in close contact with them. It finally is lost near the vas prominens of the ligamentum spirale.

13. According to KIRILZEW, the internal nucleus and Deiters's nucleus are not the terminal areas for the posterior root of the auditory nerve. The anterior nucleus, the tuberculum acusticum, both superior olivary bodies, and the posterior corpus quadrigeminum of the opposite side are the primary centres of the cochlear nerve. The fibres of the posterior root, which terminate in the superior olivary bodies and in the posterior corpus quadri-

geminum, run to the former by way of the corpus trapezoides, and to the latter by way of the corpus trapezoides and the fillet (lemniscus). The course of the striæ medullares, which is minutely described, necessitates the assumption that they represent an association-tract connected with the centres, and in close relationship with the primary centres of the posterior root of the auditory nerve. The inferior fillet contains fibres to the superior olivary body on the same side, connecting the latter with the posterior corpus quadrigemimum. In the corpus trapezoides the fibres of the inferior fillet run to the anterior nucleus, and connect the latter with the inferior corpus quadrigemimum of the opposite side. The anterior root probably passes partly into Bechterew's nucleus, partly descends into the ascending root of the auditory nerve described by Roller. An extensive work upon this subject is promised.

14. From OSTMANN's investigations it would seem that dolichocephalic skulls usually have circular, brachycephalic skulls oblong-oval auditory canals. KILLIAN.

b.—NASO-PHARYNGEAL CAVITY.

15. SCHADEWALD, O. Bleeding polypus of the nasal septum. *Archiv f. Laryngol. u. Rhinol.*, vol. i., p. 259.

16. ALEXANDER, A. Remarks upon the anatomy of "bleeding polypi of the septum." *Ib.*, p. 265.

17. SCHEIER, M. Contribution to the question of bleeding polypi of the septum. *Ib.*, p. 267.

18. HEYMANN, P. Upon the question of bleeding tumors of the nasal septum. *Ib.*, p. 273.

19. ESCAT, E. Anatomical evolutions and transformations of the naso-pharyngeal cavity. Thesis for the degree of doctor. Paris, 1894.

15, 16, 17, 18. The growths described by SCHADEWALD and the other authors cited above consisted of a connective-tissue framework infiltrated with round cells. Elastic fibres also were occasionally seen. Hemorrhages were found quite frequently. Blood-vessels were not always conspicuously present, but in some places there was an abundance of lymph-spaces. The tumors were lined partly with flat, partly with cylindrical epithelium, and in the deeper layers glands were frequent. The tumors were invariably benign.

19. ESCAT's profusely illustrated work is based upon forty-two autopsies. He finds that in infants and children (and also in women as compared with men) the sagittal diameter of the naso-pharynx predominates, as compared with the vertical, producing an antero-posteriorly elongated cavity. In such cases the posterior nares are more readily obstructed than in those of the opposite type. In brachycephalic skulls the transverse diameter, in dolichocephalic skulls the sagittal diameter is greater. The anterior and posterior borders of the vomer usually show correspondence as regards their degree of inclination. The author concludes with a description of the anomalies of development of the third tonsil and the recessus medius. GELLÉ.

B.—PHYSIOLOGY AND PHYSICS.

a.—ORGAN OF HEARING.

20. MATTE, F. Experimental investigations upon the labyrinth in doves. *Fortschr. d. Medicin*, No. 4, 1894.

21. SCHÄFER, K. L. (Rostock). The function and the development of the function of the semicircular canals. From the Rostock Physiological and Anatomical Laboratory. *Zeitschr. f. Pyschol. u. Physiol. der Sinnesorgane*, vol. viii.

22. BEAUREGARD, H. Note upon the part played by the organ of Corti in audition. *Comptes rend. de la soc. de biol.*, No. 22.

23. EWALD, J. R. The central origin of the beats produced by two tones heard in one ear. From the Physiological Laboratory of the University of Strasburg. *Pflüger's Arch. f. Physiol.*, 1894, vol. lvii.

20. MATTE found that by introducing a sound into one of the semicircular canals of one ear pendulum-like movements were produced in the plane of the canal operated upon, and when sounds were introduced into the semicircular canals of both ears, the intensity of these movements increased, and a disturbance of the movements of the body was caused. If the operation was performed upon canals situated symmetrically in the two ears movements were produced in the median plane. Inasmuch as these phenomena ceased after the sounds were withdrawn, they must be regarded as symptoms of irritation simply. If the labyrinth is completely removed on one side, disturbances of equilibrium set in, but not until after a week had elapsed, and they disappeared

again after removal of the other labyrinth. In doves deprived of the labyrinth no signs of a perception of sound could be made out to exist. In two or three weeks after the operation the fibres of the auditory nerve were found to be degenerated as far as the central ganglia.

21. From SCHÄFER's earlier studies it is pretty certain that invertebrates do not exhibit any evidences of vertigo directly after being rotated upon a revolving disc,[1] and that in this respect there is a sharp contrast between vetebrates and invertebrates, that is between animals with and without a labyrinth. In tadpoles a vertigo produced by rotation does not occur until the development of the semicircular canal is complete. This fact is regarded as of eminent importance as fitting the requirements of the theory that the labyrinth is a static organ.

b.—NASO-PHARYNGEAL CAVITY.

24. AROHNSOHN, E. An attempt at a nomenclature of the qualities of smell. Paper presented at the Laryngological Section of the Eleventh International Congress held at Rome, 1894. *Arch. f. Laryngol.*, vol. ii., part 1.

24. Starting with the idea that different fibres of the olfactory nerve possess varying degrees of energy, AROHNSOHN invents terms for different groups of olfactory qualities, based upon the chemical symbols of some one representative of the class of odors in question. Time alone will tell whether the whole system which he advocates has any value at all other than as a mere plaything.

II.—PATHOLOGY AND THERAPEUTICS.

By Dr. ARTHUR HARTMANN, Berlin.

Translated by Dr. A. DUANE, New York.

GENERAL LITERATURE.

1. GRUNERT. Annual report of the aural clinic of the Royal University of Halle from April 1, 1892, to March 31, 1893. *Arch. f. Ohrenheilk.*, vol. xxxvi., p. 278.

2. DE ROALDES, A. W. Report of Ear, Nose, and Throat Hospital of New Orleans for 1893.

[1] How does this statement agree with the fact that many of these animals seem to have a static organ?—REVIEWER.

3. SCHWARZBACH, B. Notes on noises in the head. *Australasian Gazette*, Feb. 15, 1894.

4. GUDER, E. Contribution to the study of the question of reflex cough and particularly of auricular cough *Rev. de laryng. et d'otol.*, 1894, No. 6.

5. TSAKYROGLOUS, M. (Smyrna). Aural affections following parotitis epidemica. *Monatsschr. f. Ohrenheilk.*, 1893, No. 10.

6. HUTCHINSON, JONATHAN. Syphilitic inflammation of the ear. *Arch. of Surg.*, April, 1894.

7. POLITZER, A. A new anatomical condition found in deaf persons. *Wien. med. Blätter*, 1894, No. 24.

8. NAGER, G. Tests of hearing made in the city schools of Luzerne in the years 1892–3. Reprint from the Annual Report of the City Schools of Luzerne.

9. COËN, R. Acoustic exercises for improving the capacity for speech and hearing. *Wien. med. Wochenschr.*, 1894, No. 5.

10. BARCLAY, ROBERT. On the relation between diseases of the teeth and ears. *Dental Cosmos*, May, 1894.

11. BARCLAY, ROBERT. Behavior of the ear in fracture of the base of the skull. *St. Louis Med. and Surg. Jour.*, May, 1894.

12. Summary of diseases presented for treatment at the Throat Department of the New York Eye and Ear Infirmary, from October 1, 1891, to October 1, 1893. *N. Y. Eye and Ear Infirmary Reports*, vols. i. and ii., 1893–4.

13. Report of diseases treated at the Throat Department of the Manhattan Eye and Ear Hospital, during the year 1893. *Manhattan Eye and Ear Hospital Reports*, 1894.

1. GRUNERT reports that in the past year 1636 patients were treated in the Halle ear clinic, 201 of whom were in the hospital department.

The operation of opening the antrum was performed 71 times, and in 47 with a permanent good result. Extraction of the malleus through the auditory canal for the relief of chronic suppuration with fistulæ situated high up was done 7 times with 4 cures. Of the 5 cases of extraction of both malleus and incus 3 were cured.

"Cases of isolated caries of the ossicles have turned out to be comparatively rare. Usually such caries is complicated with caries of the wall of the attic and of the mastoid antrum. In our

experience the outlook for obtaining a prompt relief of suppuration by extracting the malleus and incus is favorable only when we are dealing with simple intermediary perforations in the drum-membrane, that is with perforations in Schrapnell's membrane or in the postero-superior portion of the membrana tympani, which corresponds to the region of the long arm of the incus."

The fatal cases are described at length :

1. Death from hemorrhage into the right internal capsule and the ventricle (aneurism ?). No connection with the chiselling of the mastoid, which was done a month before.

2. Death during the operation, due to extreme anæmia. In this patient (a child), a retro-auricular abscess had been incised the day before reception into the hospital, and the bleeding had not been arrested.

3. Chronic suppuration with caries in both ears ; purulent meningitis without symptons, existing before the date of reception into the hospital ; cerebral abscess.

4. Chronic suppuration of the left ear with caries ; meningitis. "It is to be assumed that the infection of the meninges did not result till the fourth month after the operation. Possibly the cauterization of the luxuriant granulations in the operation-wound was accountable for the progress of the suppuration into the cranial cavity."

5. Chronic suppuration in both ears ; otitic cerebral abscess. "The discovery, upon autopsy, of a large abscess in the temporal lobe surprised us greatly. There was not a single symptom during life that would have led us to suppose the existence of such a condition."

6. Tubercular basilar meningitis. Not operated upon.

7. Death from meningitis which was in existence before the time of the operation (which was done for cholesteatoma).

RUMLER, Berlin.

2. DE ROALDES reports that during 1893 there were treated at the Ear Department of the New Orleans Eye, Ear, and Throat Hospital, 1221 ear patients and 684 nose patients. These are all well tabulated as regards age, sex, and color. There were two cases of chiselling of the mastoid and antrum.

SWAN M. BURNETT.

3. SCHWARZBACH insists upon the importance of treating cases of noises in the head experimentally, even when the exact etiology and pathology cannot be determined, on the hope of hitting upon some remedy by chance. He instances a case in which Lucae's treatment by counter-sounds had an unexpectedly good result.

U. PRITCHARD.

4. In Wyss's clinic (Ghent) GUDER succeeded in producing by

irritating the external auditory canal, a reflex cough, such as is so often caused by foreign bodies, particularly when dry and movable, in 21 per cent. of 200 patients suffering from the most various kinds of disease. Two of the cases of cough due to foreign bodies were observed. This reflex was found mainly in the second decade of life and especially in male patients. The cough is not the only reflex set up, since gastric, sexual, and cardiac disturbances may make their appearance; and the auditory canal is not the sole point of origin of reflex cough, since the latter may also have its starting-point in the pharynx, œsophagus, stomach, etc. In the auditory canal the postero-inferior wall is the only part irritation of which (by causing stimulation of the auricular branch of the pneumogastric) is able to cause reflex cough in persons who are not otherwise diseased and particularly in those who are not nervous. ZIMMERMANN (Dresden).

5. TSAKYROGLOUS has observed as a result of parotitis epidemica various phenomena which are indicative of a slight inflammation of the labyrinth. KILLIAN.

6. HUTCHINSON suggests that the secondary syphilitic affections of the middle ear are very analogous to the similar affections of the eye, and like these latter demand prompt and energetic antisyphilitic treatment. In the tertiary stage, he believes that the ear affections are less important and seldom permanent.

U. PRITCHARD.

8. NAGER has made exhaustive examinations of 1127 scholars in the primary and secondary schools of Luzerne. These gave very unfavorable results, namely 40.39 per cent. of deafness. The abnormally high ratio of disease depends mainly upon the comparative frequency with which catarrh of the Eustachian tubes occurs, and, according to the author, is caused by the dampness of the lake-climate. The unfavorable influence which, as the author proves statistically, deafness exerts upon the capacity for learning, calls pressingly for the establishment of special classes (for those deficient in sensory perception). SIEBENMANN.

9. COËN confirms Urbantschitsch's statements with regard to the possibility of obtaining marked improvement of the hearing in the deaf by means of acoustic exercises. Coën's cases relate to persons who have suffered from more or less marked deafness and from a consecutive total or partial loss of speech or from general stammering. Coën has no experience with respect to the availability of this method for the instruction of deaf-mutes. POLLAK.

10. BARCLAY, after going over the ground again of the connection between diseased teeth and affections of the ears, reports two cases in which persistent pain in the ear was relieved by extraction of diseased teeth on the same side. SWAN M. BURNETT.

11. BARCLAY relates the histories of three cases of injury to the head in which the ear was immediately implicated. In one there was the usual serous discharge with a perforation of the *Mt* on one side, which recovered. The therapeutics consisted in keeping it clean with peroxide of hydrogen. In the second the discharge was bloody at the beginning and afterwards was profusely serous; *Mt* ruptured. The patient died. In the third there was left facial paralysis and constant hemorrhage from the left ear for thirty-six hours, and a severe tinnitus. The *Mt* was ruptured. The patient recovered fair hearing power.

SWAN M. BURNETT.

12. The total number of diseases of the nose and throat treated at the New York Eye and Ear Infirmary during the year ending October 1, 1892, was 1889, and during the year ending October 1, 1893, 1648; the number of operations performed during the first year was 360; during the second, 398. M. TOEPLITZ.

13. The number of diseases of the nose and accessory sinuses treated at the Manhattan Eye and Ear Hospital was 2058; of the mouth and pharynx, 784; the number of operations performed on the nose and rhino-pharynx was 438; on the mouth and pharynx, 144. M. TOEPLITZ.

INSTRUMENTS AND METHODS OF EXAMINATION AND TREATMENT.

14. ROHRER (Zurich). Upon the perception of the high and the deep tones in affections of the labyrinth, etc., and of the auditory nerve. Paper presented at the 65th meeting of the Association of German Scientists and Physicians.

15. EULENSTEIN, H. (Frankfurt a. M.). The applicability in diagnosis of percussion of the mastoid. *Monatsschr. f. Ohrenheilk.*, 1894, No. 3.

16. LUCAE. Upon some essential improvements in his elastic pressure-sound and its therapeutic application in certain forms of chronic disturbance of hearing. *Berlin. klin. Wochenschr.*, 1894. No. 16.

17. KIRCHNER (Würzburg). Apparatus for the gymnastic exercise of the drum-membrane and ossicles. *Monatsschr. f. Ohrenheilk.*, 1893, No. 10.

18. Von Stein, Stanislaus (Moscow). A further contribution to the question of employment of trichloracetic acid. *Ibid.*, 1894, No. 1.

19. North, John. A new portable air-compressor. *New York Med. Rec.*, June 2, 1894.

20. Houghton, Henry C. Music as a means of aural massage. *Journ. of Ophthalmol., Otol., and Laryngol.*, April, 1894.

21. Müller, J. A means of diagnosticating suppuration in the mastoid process. *Wien. med. Wochenschr.*, 1894, No. 11.

14. In the cases which Rohrer groups under what he calls "Torpor nervi acustici," the perception of high tones (Galton 1.8) was perfectly retained; while in 27 out of 30 patients examined with Bezold's C^2 tuning-fork this tone also was perceived. In the other labyrinthine affections, on the other hand, the upper limit of tones proved to be lowered (generally to 3.15 of the Galton whistle), while the perception of the deeper tones was well preserved. Siebenmann.

15. In 9 cases of mastoid disease observed by Eulenstein percussion gave a positive result in 6, in all of which there was a large mass of diseased tissue. A negative result from percussion is no proof, according to Eulenstein that disease is not present, a fact which Moos was the first to point out. Killian.

16. The improvement in the instrument which Lucae presented at the first meeting of the German Otological Society in the spring of 1892, consists in the addition of what he calls a stuffing-box, which enables the operator to introduce the sound safely and without jerking. The sensitiveness of the short process is blunted as far as possible by the application of moist cold during the operation. For this purpose the bulb of the sound is wound with cotton and immersed for some time in a freezing solution of cocaine. Under these conditions the pressure-sound can be applied more frequently and more energetically, and hence better therapeutic results are obtained and, moreover, affections of the sound-conducting apparatus can, by the expert, be differentiated from those of the labyrinth, as they could not be before. Rumler.

17. Kirchner's apparatus consists of a rubber tube provided with a nozzle at one end for the mouth and one at the other end for the ear. A glass bulb with a plug of cotton for filtering the air is intercalated between the two ends. By means of this apparatus the patient can readily produce rarefaction and condensa-

tion of the air in the auditory canal. Kirchner in suitable cases has this exercise carried out from one to three times a day for a few minutes at a time. KILLIAN.

18. VON STEIN shows that even in very weak solutions (1:1500 or 2000) trichlor-acetic acid prevents putrefaction and is hence adapted for the after-treatment of wounds in the nose and throat. In ozæna the foul odor disappears rapidly, and the formation of crusts diminishes under the application of ½–10 per cent. solutions, which must be rubbed thoroughly into the mucous membrane everywhere. In order to strictly localize applications of caustics made to the nose, Von Stein uses Zaufal's fenestrated specula. KILLIAN.

19. NORTH'S portable air compressor is to be used at the bedside, and its two rubber bulbs are compressed alternately by the foot. It is ten inches long, two and a half inches wide, and four inches high, is made of rubber and metal, and weighs five pounds. The instrument is made by O. R. Bonnewitz & Co., of Toledo, O. M. TOEPLITZ.

20. HOUGHTON is convinced from his experience that aural massage by music is a most valuable means of treating certain forms of chronic deafness, and that it is safe in skilful hands, but liable to do damage in the unskilful, and that it is useful in prognosis. The form of instrument which he uses now is the adaptation of the Engelmann induction apparatus, which consists in placing in the secondary current a magnet acting on a metallic diaphragm, the vibrations of which are conveyed to the external auditory canal by an ordinary stethescope. The interruptions are regulated so that there can be obtained vibrations from 5000 per minute to the highest. SWAN M. BURNETT.

21. MÜLLER employs in the following way Gabritschewsky's pneumatoscope for determining the pneumatic condition of the mastoid process in order to diagnosticate the presence of collections of pus in the latter. The patient places the sound-receiver of the pneumatoscope in his mouth. The bulbs of the two arms of the otoscope which is connected with the receiver are inserted in the ears of the examiner. The latter now places a C^2 tuning-fork upon the patient's mastoids, beginning with that of the affected side, and keeping it there until the sound ceases. The fork will then be heard again for some moments longer if the physician places it (without striking it again) upon the mastoid of the sound side. POLLAK.

EXTERNAL EAR.

22. ZIEM, C. Upon the removal of foreign bodies from the auditory canal. *Monatsschr. f. Ohrenheilk*, No. 3, 1893.

23. SCHMIEGELOW, E. Foreign body in the tympanic cavity. Extraction. Tetanus. *Rev. de laryngol. et d'otol.*, No. 5, 1894.

24. HOVVER, T. PIERCE. Macrotia. A report of six cases with malformations. *Manhattan Eye and Ear Hospital Reports*, Jan., 1894.

25. THORNER, MAX. Pathological conditions following piercing the lobules of the ear. *Journ. Amer. Med. Assoc.*, Jan. 27, 1894.

22. ZIEM's first case was one of a pea which was removed from the auditory canal by the galvano-cautery and instillations of oil; his second one, of a coffee-bean, removed by instillations of oil alone.

23. SCHMIEGELOW's case was that of a four-year-old boy who had put a stone into his left ear. The stone had been driven into the middle ear by instrumental manipulation in the hands of a physician. Eleven days afterwards an abscess formed about the auditory meatus, and then the stone was extracted, the auricle and membranous canal being detached for this purpose. The wound was sewed up. On the second day pain in the temporo-maxillary articulation set in, and on the third day convulsions, and rigidity of the neck and extremities—in a word, typical tetanus. On the sixth day the child died. The author thinks with reason that particles of earth which contained tetanus-bacilli, and which were adherent to the stone, were detached by the unfortunate attempts at extraction, and thus got into the blood-current.

ZIMMERMANN.

24. In all the cases reported by HOVVER the malformation was limited to the soft parts of the ear, and there was closure of the meatus. In four of the cases, an operation was done to render the canal pervious, but in each instance it closed again.

SWAN M. BURNETT.

25. THORNER has found as a result of piercing the lobules of the ear the following morbid conditions: erysipelas of the auricle and face, cleft lobule, eczema of the auricle, fibroma, fibro-chondroma, and keloids of the auricle. SWAN M. BURNETT.

MIDDLE EAR.

26. HARTMANN, A. Middle-ear inflammation in infants. *Deutsch. med. Wochenschr.*, No. 26, 1894.

27. ASHER, L. Upon middle-ear inflammation after resection of the trigeminus. In the *Beiträge z. klin. Chirurgie*, by Bruns, Ganz, and others.

28. LANNOIS. Otitic origin of a certain number of cases of facial paralysis "a frigore." *Sem. médicale*, Aug., 1894.

29. ZAUFAL, E. Actinomycosis of the middle ear. Actinomycotic abscess in the vicinity of the mastoid process. *Prag. med. Wochenschr.*, July, 1894.

30. GOMPERZ, B. Upon the development and the present status of the question of the excision of the drum-membrane and ossicles. *Monatschr. f. Ohrenheilk.*, No. 12, 1892; Nos. 1–4, 1893.

31. MOURE. Upon the extraction of the ossicles in otorrhœa. *Rev. de laryngol.*, April 15, 1894 (supplement).

32. FORSELLES, A. AF. Contribution to the subject of the operative treatment of chronic purulent inflammation of the middle ear. *Arch. f. Ohrenheilk.*, vol. xxxiv., p. 145.

33. LUC. Contribution to the question of opening freely the cavities of the middle ear, as a means of curing certain rebellious cases of otorrhœa. *Arch. intern. de laryngol.*, vol. vii., part 3.

34. BACON, GORHAM. The treatment of chronic suppurative otitis media. *New York Eye and Ear Infirmary Reports*, Jan., 1894.

35. HARRIS, THOS. J. Otitis media suppurativa chronica; removal of malleus. Intermittent fever simulating localized meningitis. *Manhattan Eye and Ear Hospital Reports*, Jan., 1894.

36. BURNETT, C. H. The surgical treatment of chronic tympanic vertigo, often miscalled Ménière's disease. *Trans. of Amer. Otol. Soc.*, 1893.

37. BURNETT, C. H. Three cases of chronic tinnitus aurium and tympanic vertigo, relieved by removal of the stapes. *Med. News*, April 28, 1894.

38. BACON, GORHAM. Middle-ear operations. *New York Med. Journ.*, April 14, 1894.

39. JACK, F. L. Further observations on the removal of the stapes. *Trans. of Amer. Otol. Soc.*, 1893.

40. BLAKE, C. J. Stapedectomy and other middle-ear operations. *Trans. of Amer. Otol. Soc.*, 1893.

41. BURNETT, C. H. Persistent mobility of the stapes in some cases of chronic catarrhal deafness. *Annals of Ophthal. and Otol.*, July, 1894.

42. SEISS, R. W. The treatment of tinnitus in aural sclerosis. *Annals of Ophth. and Otol.*, Jan., 1894.

43. REINHARD. Otitic cholesteatoma. *Jubilee Book of the Düsseldorf Physicians*, Wiesbaden, 1894.

44. LANGE, V. (Copenhagen). Some clinical remarks upon lesions of the mastoid process resulting from acute suppuration of the middle ear. *Arch. f. klin. Chirurgie*, vol. xlvii.

45. MOLL (Arnheim). Trephining of the mastoid apophysis. Reprint from *Rev. de laryngol., de rhinol. et d'otol.*, 1894.

46. MAUREL. Trephining of the mastoid apophysis. Secondary union of the wound. *Rev. de laryngol. et d'otol.*, 94, 1892.

47. VULPIUS, WALTER. Stacke's radical operation for obstinate chronic otorrhœa. *N. Y. Med. Record*, June 16, 1894.

48. BUCK, A. H. The strongly counter-irritant effects of the usual mastoid operation. *Trans. of Amer. Otol. Soc.*, 1893.

49. VON BECK. Contributions to the pathology and surgery of the brain. *Beit. z. klin. Chirurgie*, vol. xii., No. 1.

50. BUTLER. Acute inflammation of the middle ear following influenza. *Canadian Practitioner*, March, 1894.

51. SUTPHEN, T. Y. Autopsies in two cases of complicated middle-ear disease. *Trans. of Amer. Otol. Soc.*, 1893.

52. KNAPP, H. Two cases of ear disease with brain symptoms. Mastoid operations in both. Recovery in one, death in the other. *Trans. of Amer. Otol. Soc.*, 1893.

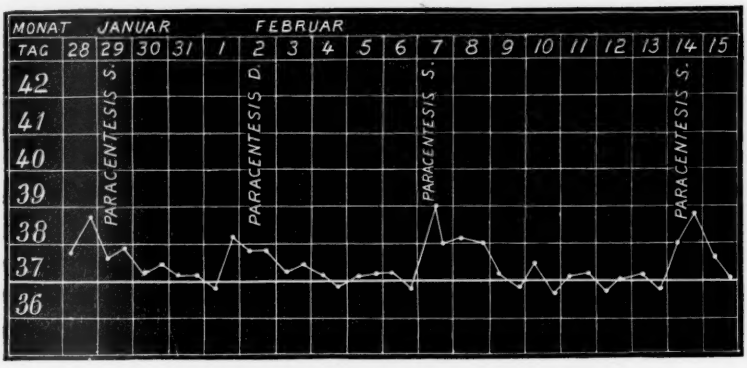
53. POOLEY, T. R. A contribution to the brain surgery of ear disease. *Trans. of Amer. Otol. Soc.*, 1893.

54. GRUENING, E. A case of septic thrombosis of the lateral sinus, with autopsy. *Trans. of Amer. Otol. Soc.*, 1893.

55. BURNETT, C. H. A case of otitic brain abscess. Operation. Recovery. *Annals of Ophth. and Otol.*, April, 1894.

26. HARTMANN examined in Koch's Institute for Infectious Diseases forty-seven infants who had been taken in for various affections with regard to the condition of the ear, and found that thirty-seven of them were suffering from otitis media. The

author was convinced from his examinations that we should not be discouraged by the statements in otological literature in regard to the horizontal position of the drum-membrane in the new-born, the great development of the epidermic layers over the drum-membrane, and the deficient lumen in the inner segment of the auditory canal. He always succeeded in getting, even in children a few days old, a view of the drum-membrane resembling that obtained in adults. A very good illumination is requisite for this examination, sunlight reflected by a plane mirror being usually employed. The work of cleaning out the canal is often very tedious. The certainty with which the temperature is affected by paracentesis of the drum-membrane is shown by the following temperature curve.



The case was that of a child affected with broncho-pneumonia, in whom paracentesis was done five times, with the result each time that the temperature fell to normal after the paracentesis. The final results are found in the report of the meeting of the German Otological Society.

27. A case of neuroparalytic otitis analogous to the keratitis which sets in after section of the trigeminus has not been so far observed clinically, so that the case described and analyzed by ASHER is the first of its kind.

In a woman suffering from a follicular pharyngitis with muco-purulent secretion, a violent typical exudative otitis media set in upon the right side four weeks after an intracranial resection of the second and third branches of the right trigeminus. The author concludes that the disturbances of sensibility occurring in the auditory canal, drum-membrane, and probably the drum-cavity itself, and the vaso-motor disturbances, which gave rise to a swelling of the whole right half of the face, as well as to the

œdema of the drum-membrane and middle ear, were caused by the resection of the trigeminus, and supplied the conditions requisite for the production of an infection of the middle ear from the naso-pharyngeal space. The scanty literature is fully reviewed, and the case itself is illustrated by means of critical remarks.

28. The etiology of peripheral facial paralysis, which is very frequently obscure, is often found in an otitis media that has been overlooked ; the latter leading to a swelling of the neurilemma of the facial nerve, especially in cases in which fissures are present in the facial canal. LANNOIS has observed several interesting cases having this etiology ; they are characterized by fever, general symptoms, and in half of the cases by earache and disturbances of hearing. Hence in peripheral facial paralysis the ear ought always to be examined, since by proper treatment of the latter the prognosis may be essentially improved.

29. ZAUFAL did a chiselling of the mastoid in a case which he regarded as an insidious acute otitis media without perforation of the drum-membrane, and which was complicated with deep abscesses in the throat and neck. Right below the linea temporalis he opened into quite a large pneumatic cell. In the midst of the granulation-tissue which filled this cell there was a green nodule of the size of a millet-seed. This and the granulation-tissue were removed with the sharp spoon, the wound was deepened, and at the same time the posterior wall of the canal was removed, until an opening was made into the posterior portion of the antrum. The latter was filled with granulations, between which, too, was found a group of round green granules. The actinomycotic nature of the process was made perfectly certain by the microscopical examination of these bodies. Zaufal assumes that the process occurred primarily in the tympanum, and, starting from this point, had passed through the incisura mastoidea, and thus induced the deep abscess of the neck. As regards the way by which the infection was transmitted, Zaufal, inasmuch as nothing was discovered to account for it at the ordinary avenues of entry, considers it both possible and probable that infection had occurred through the medium of a foreign body which had perforated the wall of the pharynx or mouth, and had made its way between the deep muscles of the throat and neck.

In an addendum to the original article Zaufal says that the patient had died suddenly from rupture of the vertebral artery.

He also states that a case of actinomycotic disease of the ear had been already described by Majocchi in the *Riforma med.* for 1892. POLLAK.

30. GOMPERZ treats of his theme exhaustively, making at the same time the most thorough use of all the literature upon the subject. As regards the indications for excising the ossicles, he remarks that this particular operation is not justifiable in cases of suppuration with quite large reniform or heart-shaped perforations, or cases of destruction of the drum-membrane extending as far as the antero-superior margin and combined with an apparent or perspective shortening of the malleus due to its lying close against the promontory, or finally in cases of total perforation, since cases of this sort get well without any operation. The operation should be performed, and very speedily too, in order to prevent the development of meningitis and cerebral abscess, in cases of inflammation of the tympanum and mastoid, in which, after chiselling of the latter, symptoms like vertigo, nausea, vomiting, and headache persist. Gomperz has done good service in showing, by a great array of cases, that curative results which far surpass those got by otologists who do radical operations as a matter of principle are obtained by simple conservative treatment (irrigation with the tympanic cannula and insufflations of boric acid through the latter into the attic). Moreover, the conservative treatment usually affords excellent results as regards the maintenance and improvement of the function of hearing. It should be tried first in all cases in which there are no serious symptoms calling for the speedy performance of an operation for laying open the attic and removing the ossicles. A cure is possible even in circumscribed caries of the malleus and incus. KILLIAN.

31. MOURE, upon the basis of two histories of cases which are exhaustively described, speaks regarding the significance of the extraction of the malleus or of the malleus and incus together for the cure of chronic suppuration of the middle ear. He operates under cocaine anæsthesia or in nervous patients under narcosis with chloroform or ethyl bromide. He operates : (*a*) in case of caries of the ossicles ; (*b*) when the ossicles are sound, but the suppuration cannot be arrested in other ways, and there is a prospect of affording a free exit to the pus by means of the operation. He gives the operation also the credit of effecting a diminution or abolition of the tinnitus and frequently an improvement of hearing. It is rare that the latter is diminished. The author

opposes extraction of the stapes on account of the alarming character of the reaction and the danger of producing infection of the labyrinth. ZARNIKO.

32. FORSELLES, in chiselling of the mastoid, tried to accelerate the process of healing by using, two days after operation, Thiersch's skin-flaps, which then were not interfered with by hemorrhage. Afterwards he tried to secure a more rapid covering in of the wound by cutting out a large flap from the skin over the mastoid process and introducing this flap into the hole in the bone. In this way it was possible to cover nearly the whole posterior wall of the hole with healthy skin. Forselles recommends further experiments with skin-flaps taken from the mastoid region, combined with a flap fashioned out of the skin of the auditory canal by means of two parallel incisions. RUMLER.

33. LUC says that in those cases of otorrhœa in which we have first employed a careful local treatment and then removed the ossicles, but which still run on for months, we ought not to delay opening the attic and antrum. There are certain symptoms which specially oppose delay in operating. Such are: The presence of fungosities in the attic as determined by the sound, or of a fistula in the upper wall of the bony canal, or irrepressible, recurrent polypoid growths in the region of the aditus; or, lastly and chiefly, the persistence of fetor at the fundus of the ear, even when the discharge has abated and irrigations are made through the Eustachian tubes or with Hartmann's cannulæ. The only mishap that the author has to complain of was in Case IV. where there was a complete facial paralysis. This, however, was unavoidable on account of the very great extent to which it was necessary to carry the operation if the prospect of obtaining a cure by the latter means was not going to be given up altogether.

34. During the year BACON saw 234 patients affected with chronic suppuration of the middle ear, of whom 131 were men and 103 women. Large polypi were found in 24 cases. The most frequent causes were colds, scarlet fever, diphtheria, whooping cough, measles, teething, and adenoids. The usual treatment in the simple, uncomplicated cases was syringing with warm water and instillations of drops of zinc sulphate and boric acid. He prefers this to the insufflation of powders for use by the patient. When the attic is involved he uses for cleansing purposes and to apply medication the apparatus devised by Dr. J. Hewett. The treatment of the nose and pharynx and constitutional means are

strongly insisted on. One case of removal of malleus and incus is reported. SWAN M. BURNETT.

35. HARRIS's case was a man fifty years old, who was suffering from chronic suppurative otitis media on the right side, which had existed for three years. Large perforation in anterior segment of *Mt.* Carious bone was suspected and the malleus was removed. No reaction, and patient discharged at the end of three days. Ten days after he returned with a temperature of 103°. The course of the fever suggested meningitis, but a careful survey of the symptoms rather militates against that view, and its connection with the operation on the ear. SWAN M. BURNETT.

36. BURNETT relates the histories of ten cases of chronic tympanic vertigo, which he treated surgically, and a summary of his conclusions from this experience is that the removal of the retractive force of the sound conductors upon the stapes is an efficient means of relieving tinnitus, deafness, and vertigo due to lesions of chronic catarrh in the middle ear. This can be sometimes effected by removal of the incus alone or by resecting its long process. It would seem wise, therefore, in most cases, not to sever the stapedius muscles and remove the stapes, but only remove the incus. SWAN M. BURNETT.

37. BURNETT's cases are as follows: 1. Chronic dry catarrh of long standing; *Mt.* retracted but not thickened; hearing in left nil; right, through the trumpet; tuning fork by bone in neither ear. Vertigo and excessive tinnitus. Removal of incudes. No vertigo after the operation, and tuning fork heard by bone in both ears, and some improvement in hearing in right ear. 2. A case of "traumatic catarrh" in the right ear caused by a fall, with resulting vertigo and tinnitus and deafness; left ear normal. Right incus removed, with an improvement in the tinnitus and head symptoms. 3. Also a case of traumatic origin. Total deafness; tuning fork on vertex not heard on that side; dizziness and tinnitus. *Mt.* normal in appearance. Incus removed. Tinnitus better, dizziness gone, and some improvement in hearing.

SWAN M. BURNETT.

38. From his experience in middle-ear operations, BACON thinks that the operation of stapedectomy is not advisable in chronic non-suppurative disease, and from excision of the drumhead and of one or more of the ossicles, he has had fairly satisfactory results in only four cases. SWAN M. BURNETT.

39. JACK has made 32 additional stapedectomies since his last

report, amounting now to 48 in all. A summary of his conclusions is that the operation is followed by the best results where, from increase of tissue, the effect of suppuration or hypertrophic inflammation, the stapes offers an obstruction to sound waves, but in chronic otitis media insidiosa, on account of the failure to extract the foot-plate, the results are not encouraging. The results of the operation are not commonly bad, but the improvement in hearing is not usually for all tones, and those of the human voice are best perceived, though the reverse is the case sometimes. He thinks failure in some instances due to hemorrhage into the labyrinth. SWAN M. BURNETT.

40. BLAKE reviews the conditions of the stapes as they exist in chronic non-suppurative disease of the middle ear, and in those conditions due to suppuration, and is inclined to think, from his experience, that in the non-suppurative form removal of the stapes is of doubtful efficacy. In 21 cases which he tabulates only 3 were benefited, and in these there were some exceptional conditions which favored the success of the operation. Under any circumstances he favors the making of an exploratory tympanotomy, which can be done without general anæsthesia, and then determining by further examinations and tests whether any interference is advisable. In the suppurative form, on the other hand, he finds loosening the base of the stapes of very decided benefit, particularly when the disease is not of very long standing. SWAN M. BURNETT.

41. In six cases of catarrhal deafness, tinnitus aurium, and tympanic vertigo, in which BURNETT performed tympanotomy and removed the incus, he found the mobility of the stapes perfect. In those cases the hearing was not improved, but the symptoms of labyrinthine pressure—tinnitus, vertigo, etc.—were. One case in illustration is given in full. SWAN M. BURNETT.

42. For the relief of tinnitus in aural sclerosis SEISS uses intratubal injections of the pure fluid albolene, and the vapor of menthol, and sometimes freezes the skin over the mastoid by means of vaporized chloride of ethyl. SWAN M. BURNETT.

43. REINHARD has operated upon twenty-six cases of cholesteatoma of the middle ear and the mastoid process in five years. After giving this record of cases, he describes with great precision the prevalent theories of the pathology of cholesteatoma, and the anatomy of the cavities in question. With regard to the treatment, he recommends that the cholesteatomatous masses be

syringed out with the tympanic cannula (the drum-membrane and malleus being removed, if necessary), or washed out by irrigations made through the Eustachian tube. In most cases, however, a radical operation is required; either Stacke's or Schwartze's, or a combination of the two, being employed according to the extent of the process. Subsequently transplantation of Thiersch's skin-flaps into the wound is performed, and the wound is kept open. As a matter of prophylaxis it is advised that suppuration in the ear be treated as early as possible, and accordingly a plea is made for the inclusion of an otological examination among the tests made by the government medical boards.

44. LANGE lays down his personal views in regard to acute inflammations of the mastoid, and their etiology, symptomatology, and treatment. As regards their *etiology*, the author believes that inflammation of the mastoid is, more often than is generally supposed, caused by the treatment used. He recalls the unscientific treatment with boric acid, which has been already condemned by Schwartze, and is of the opinion that irrigation of the inflamed tympanum through the Eustachian tube, and Politzerization may drive infectious secretions into the mastoid cells. As regards the *diagnosis*, Lange considers suppuration in the mastoid most probably present when pain upon pressure is found over the middle part of the process. He lays great stress upon the increase in volume in the bone. He says that he has found that when the course of the disease is rapid the bone enlarges (particularly in young people), so that on palpation the affected side seems "to get more under the finger" than the other. It is very important for the diagnosis of an affection of the bone that the course of the disease should have been observed from its beginning. The author devotes some special observations to the subject of Bezold's perforation. As regards the *course*, he says that the patient may in general resume his work in three weeks after the operation. In two cases, affections of the joints were observed at the same time as the ear trouble, and possibly were connected with the latter. As regards *treatment*, the author charges otologists with operating too early, too frequently, and too radically. In an operation he prefers small openings. He places the chisel perpendicular to the surface, and chisels the bone away until the pus comes; then completes the operation with a sharp spoon.

45. This is a description of a case reported by MOLL of bilateral otitis following influenza, in which inflammation of the mastoid

with a typical Bezold's perforation set in, first on the right side, and afterwards on the left. On the right side Moll had to open the mastoid cells as well as the burrowing abscess. On the left side he thought that he should rest content with opening the abscess, but after eleven days was compelled to lay open the antrum also. At the date of the report both portions had healed, and a left facial paralysis, produced by the suppuration, had almost disappeared. In conclusion the author urges that in similar cases, especially when due to influenza, there should be no delay about operating upon the abscess, and that the opening of the antrum should be performed only when a cure had not been obtained by the former means. ZARNIKO.

46. MAUREL, upon the basis of a case observed in Gruber's clinic of acute suppuration of the mastoid produced by irrigation of the nose, recommends that such cases be treated by operation with the application of a secondary suture, it being premised that when the latter is done there is no collection of pus remaining in the vicinity. ZIMMERMANN.

47. After an historical review of the mastoid operation VULPIUS holds that the Stacke operation fulfils all expectations required for the radical cure of otorrhœa. It, however, should be performed only as a last resort. He justly claims that the transplantation of the external meatus makes the method much superior to all other methods. The operation is contra-indicated in acute cases. The technique of the operation is well described, and clearly illustrated by three diagrams. He approves of Panse's modification of the transplantation, which consists in detaching the meatus only along the posterior wall, and gives valuable advice for the management of the after-treatment. His two cases prove of great interest, especially the second one, in which the posterior part of the attic was found to have been plugged by an osteophyte extending from the short process of the incus along its entire length to the tegmen tympani, thus completely obstructing the aditus ad antrum. This condition explained the presence of a direct fistulous communication between the drum cavity and the antrum, which was made out before the operation. Two transplantations of skin from the forearms, made at the end of the third and fourth weeks respectively, greatly assisted in the epidermization of the operation cavity. A set of instruments are pictured, among which are bent chisels, angular knives, and an angular probe of the author's own device. Vulpius hopes that the trend of American otological work will

rather lead more toward the Stacke operation than to the heretofore much overrated intra-tympanic operations.

M. TOEPLITZ.

48. BUCK gives the histories of three cases in support of his position that an opening in the mastoid may serve as a counter-irritant in cases of grave affection of the brain associated with ear disease, even though there be no disease of the mastoid itself.

SWAN M. BURNETT.

49. This work of VON BECK'S relates to tumors and abscesses of the brain. Of the latter three in the temporal lobe and one in the cerebellum, due to otitis, were observed in the Heidelberg clinic; they ended fatally in spite of operation. The operation consisted in every case of a preliminary opening of the mastoid, exposure of the base of the skull, and subsequent puncture or incision with the insertion of a tampon of iodoform gauze in the trephine opening or abscess cavity. In one case the abscess was not diagnosticated, in two cases it was not found, and in one case there was behind the abscess which was opened another one which in spite of a second operation caused death through hydrocephalus internus. The other three cases died from the accompanying meningitis or pyæmia. After giving the histories of the cases the author considers upon very broad principles the anatomical channels of infection, and then Von Bergmann's table of abscess-symptoms. Of the otitic abscesses only one showed marked local symptoms. In this there were produced by pressure of the abscess upon the centres in the parietal and occipital convolutions, clonic contractions and enfeeblement of the extremities upon the opposite side, and cortical psycho-optic aphasia. The cerebellar abscess was complicated with unilateral bulbar paralysis and destruction of the first cervical vertebra. The difficulties in making the diagnosis between abscess on the one hand and meningitis, extra dural abscess, embolism, and apoplexy on the other, are pointed out in the following pages. To justify his statement that operation is the only treatment possible in these cases, the author collects from literature 36 cases of otitic abscesses that were operated upon, including 29 in the temporal lobe, of which 17 were cured. [Körner's statistics give 55 operations for abscess, with 29 cures.] ZIMMERMANN.

50. BUTLER points out that inflammations of the middle ear, following influenza, are characterized by the suddenness and violence of their onset, and by the greater tendency of the exudation

to become purulent. He considers gentle and soothing treatment the key to the situation. U. PRITCHARD.

51. In SUTPHEN's first case there was extensive necrosis of the temporal bone, following middle ear disease, and on the autopsy a large abscess was found in the cerebellum, which was directly connected with the mastoid, and several other smaller abscesses on the inferior surface of the cerebellum. There were also general pyæmia and metastatic abscesses in the lungs, but no general meningitis. In the second case there was a meningitis, following acute middle-ear disease, not associated with mastoid trouble, as the autopsy showed. The right lateral sinus contained a large softened clot, which communicated with the meningeal cavity. No abscess in the brain, but the entire meningeal surface of the cerebellum was bathed in pus. SWAN M. BURNETT.

52. In KNAPP's first case, a very feeble and anæmic child was operated on by chiselling the mastoid for long-continued purulent ear disease. The temporal bone was extensively necrosed, and a large part of it was removed. About a month after the operation, while the wound was being dressed, the probing was followed by a flow of dark blood, which, however, was not alarming at the time. Some hours after, the child died apparently from a continuation of the hemorrhage. The second case was one of chronic middle-ear suppuration with grave brain and lung complications. The mastoid was opened to a depth of two centimetres and a breadth of three centimetres. The bone was rather compact and no pus or granulations were found. There was, however, a sudden gush of dark blood following a blow on the chisel, which the author believed to be due to an opening in the lateral sinus. Previous to the operation there were the evidences of pyæmia, and these continued for many days after, improvement beginning on the ninth day and going on to recovery. On the fifth day after the operation the ear which had ceased discharging began to run. This soon ceased, and hearing became almost normal.

SWAN M. BURNETT.

53. POOLEY's patient was a young man of twenty-nine years, who suffered from an acute otitis following *la grippe* and who also had the secondary symptoms of syphilis. Under treatment the symptoms subsided but did not entirely disappear, and at the end of a month distinct mastoid disease was apparent for which he submitted to an operation. There was much diseased bone found and a quantity of fetid pus liberated. All dis-

eased bone was removed. He took the anæsthetic (ether) badly and was with difficulty saved from collapse. For eight days the progress was a favorable one, but at the end of that time cerebral symptoms returned—increased temperature, nausea, and headache. At no time was an optic neuritis evident. Dr. Abbe was called in consultation, and after careful watching of the case, when the man was already in a state of coma, an opening was made over the temporo-sphenoidal lobe and a hypodermic needle thrust into the brain in various directions, but no pus was found. The wound was then enlarged and the lateral sinus examined and found healthy. He had just prior to the operation paralysis of the external rectus of the left side and some difficulty in moving the left arm. He was given at different times large doses of the iodides and mercurial inunctions. No autopsy was allowed, but Pooley thinks there was a deep abscess in the brain. SWAN M. BURNETT.

54. The case reported by GRUENING is that of a women thirty-eight years old, who for several years has had a discharge from the left ear with severe headache at times. The mastoid was opened. Cortex extensively carious and covered with granulations. The cavity was cleaned out with a sharp spoon and rongeur, and the lateral sinus was exposed. It seemed healthy, and did not pulsate. A few days thereafter there was a rise in temperature, and septic pneumonia developed from which the patient died. On autopsy no disease of the brain was found, but the lateral sinus contained a cheesy fetid clot which adhered to the inner roughened wall of the sinus. SWAN M. BURNETT.

55. BURNETT's case was a girl of sixteen, who was taken into the hospital suffering apparently from an attack of *la grippe*, with pain in and around the right ear. The pain ceased rather suddenly, but soon she began to vomit and had a violent frontal headache, principally over the left eye. There was purulent discharge from both ears of long standing; temperature ranged from 101.2° to 103°, and then fell below normal, reaching 96°. A cerebral abscess was diagnosticated, but it was not possible to determine its location till after a convulsion, following which there was extreme flexion of the left arm over the chest and increased knee-jerk and some ankle-clonus on the left side. Right pupil extremely dilated and immobile; Cheyne-Stokes respiration. The skull was trephined by Dr. De Forrest Willard. He began by trying to open the mastoid and antrum cavities (without an anæsthetic as the

patient was comatose), but as this was tedious and time was precious he opened the cranial wall one and a fourth inches behind the external auditory meatus and the same distance above Reid's base line. The abscess was found near the surface, in the substance of the temporo-sphenoidal lobe, and slightly above the opening in the skull. There was some hemorrhage from the lateral sinus and a discharge of three and one half ounces of extremely fetid pus. The right pupil contracted immediately upon the evacuation of the abscess, but dilated again when the cavity was washed out with a warm boric acid solution. The patient made a good recovery and there is not any evidence to show that the pus in the brain was due to any direct connection with the ear cavities. Burnett thinks it was metastatic.

SWAN M. BURNETT.

INTERNAL EAR.

56.* ROHRER (Zürich). Upon the perception of higher and deeper tones in the affections of the labyrinth and the auditory nerve. *Wien. med. Wochenschr.*, Nos. 8, 9, 10, 1894.

57. CARTAZ, A. Two cases of hysterical deafness. *Rev. de laryngol. et d'otol.*, 11, 1894.

58. THIEM. Upon traumatic disease of the labyrinth. *Monatsschrift f. Unfallheilk.*, vol. i.

59. MACKENZIE, STEPHEN. The nature, diagnosis, prognosis, and treatment of aural vertigo. *Brit. Med. Jour.*, May 5, 1894.

60. DALBY, Sir WILLIAM. A note on auditory vertigo. *Ib.*, May 12, 1894.

61. BONNIER, P. The vertigo of Bright's disease. *Annales de méd.*, Nos. 41, 42, 1893.

62. LEDERMANN, M. D. A case of labyrinthine disease following typhoid fever. Improvement after sixteen years' deafness. *Manhattan Eye and Ear Hospital Reports*, Jan., 1894.

63. DENCH, E. B. Affections of the sound-perceiving apparatus. *New York Eye and Ear Infirmary Reports*, Jan., 1894.

64. HELFREICH, C. H. A case of otitis interna traumatica. *Jour. of Ophth., Otol., and Laryngol.*, Jan., 1894.

56. ROHRER gives a statistical report upon ninety cases of diseases of the labyrinth and auditory nerve, in which the tests for hearing were made with a successive series of tuning-forks.

with closed organ-pipes, and with König's rods. He used for this purpose besides the a^1, c^1, and *A* forks a new deep *C* tuning-fork of 64 vibrations, a higher *c* fork of 1024 vibrations, and Appun's large fork of 12 to 36 vibrations; also closed organ-pipes ranging from a^2 to a^3 and from a^3 to f^6. The results were as follows: Torpor of the auditory nerve affects the male and female sex with equal frequency, but the left ear shows a markedly greater tendency to be diseased than does the right. The application of Weber's test showed that the tuning-fork was more frequently heard louder in the better-hearing ear; Rinné test was in the vast majority of cases positive; Gellé's *pressions centripètes* gave in 36 per cent. of the tests for air- and bone-conduction a positive, and in 64 per cent. a negative result. The appreciation of high tones was in all cases perfectly retained, but the perception time for bone-conduction was greatly reduced. Vertiginous symptoms and sensations of oppression were but slightly marked, and the subjective noises were inconsiderable; when present were of an intermediate character, *i. e.*, were roaring or singing sounds of medium pitch. POLLAK.

57. One of CARTAZ's cases, a girl sixteen years of age and not particularly nervous, was rendered incapable, by a blow upon the left ear, of uttering a single sound or of hearing the voice or the watch. Intelligence was retained and she was able to understand writing. There was anæsthesia of the left side including the left ear, which was otherwise normal. An immediate and permanent cure was effected by the galvanic current. The second case was that of a very nervous lady who was at the end of her fortieth year. As the result of strong excitement she had an hysterical attack, and, perhaps directly after this but certainly when she woke up the following morning, became completely blind and deaf. The sensory organs showed no alteration, but there was a general hyperæsthesia set up by the slightest stimuli. The application of a metal rod, which happened to be present in the room, affected a restoration of hearing for the watch and voice, and a complete cure of the hyperæsthesia also was accomplished by the application of two strong magnets. ZIMMERMANN.

58. In THIEM's case a fall from a height of one story upon the left ear was followed by tinnitus in the latter, deafness, and left-sided vertigo, especially upon movement. In Weber's test tuning-fork heard only upon the right side; on the left side, Rinné's test, positive. Diminution of hearing for watch and

speech. Loss of power to appreciate tones produced by the medium tuning-forks. In testing the hearing for speech, Thiem recommends his speaking funnel provided with two rubber tubes. No statement is made as to whether changes in the drum-membrane or temporal bone could be observed. ZIMMERMANN.

59. MACKENZIE'S paper is interesting as recording the views of an able physician rather than a specialist. The various theories as to the seat and nature of the lesion are carefully enumerated, and valuable hints as to prognosis and treatment are given. Stress is laid upon the importance of carefully watching the pulse in the interparoxysmal stage with a view to the reduction of pressure by a suitable purge, if need be. U. PRITCHARD.

60. DALBY'S paper is in the main confirmatory of Mackenzie's. It suggests that in some cases the vertiginous attacks are symptomatic of impending apoplexy and that these are the cases relieved by purgation. U. PRITCHARD.

61. According to BONNIER, vertigo may depend upon affections of the larynx, cerebrum, cerebellum, or medulla, and upon disorders of the eyes or stomach, but is most frequently occasioned by affections of the labyrinth. Like Bowman's capsule, the labyrinth forms a locus minoris resistentiæ. The mechanism of the production of vertigo may vary. Either the terminal expansion of the nerve is irritated by toxic products which accumulate in the labyrinthine fluid and then excite the complex of symptoms called by Gellé labyrinthismus; or coagula of albumin are formed which lead to obstruction of the endolymphatic passages, and consequently to abolition of the valvular action of the foot-plate of the stapes; or intra-labyrinthine hemorrhages are produced, which then give rise to the aploplectiform vertiginous attacks of Ménière. Except in this last form, the prognosis is favorable. A simple milk-diet may effect a rapid cure.

ZIMMERMANN.

62. LEDERMANN'S patient, a girl, when three years old had an attack of what her physician said was typhoid fever. On recovery she was practically deaf, and when examined by Ledermann sixteen years later could hear nothing on the left side, and cracking of finger-nails at 2 inches on the right. She was put on large doses of iodide of potassium. At the end of five months she had hearing: R, finger-nails at 5 in.; W., 2 in.; L, finger-nails, 1 inch; W. contact, and could hear conversation a little louder than ordinary. SWAN M. BURNETT.

63. A mere abstract cannot do the carefully prepared paper of DENCH justice. Within the last two years he has seen 35 cases of what he considers pure nerve deafness, classified from causes as follows: hyperæsthesia (reflex), 4; labyrinthine hemorrhage, 4; syphilis, 5; scarlet-fever, 2; senility, 5; meningitis, 2; mumps, 1; measles, 1; labyrinthine congestion, 2; alcohol and tobacco, 2; neurasthenia, 6. In diagnosis he determines the upper limit, the lower limit, and the absolute bone-conduction. For the greater number of cases he uses a series of Hartmann tuning-forks, ranging from 128 V. S. to 2048 V. S. In exceptional cases he uses a continuous series of higher notes. We should expect these lesions of the perceptive apparatus consecutive to middle-ear changes to affect principally the higher notes, since that portion of the cochlea which perceives these lies nearest the middle ear. For testing the very highest limit he uses a series of forks or whistles going as high as 32,500 V. S., and for the lowest, a fork of 64. He has made a useful modification of the Galton whistle for use in the testing of the higher limits. He has used electricity to determine the irritability of the nerves in obscure cases, and he has found that the nerve will respond to a current of from 12 to 16 milliamperes, where pain does not prevent its use. SWAN M. BURNETT.

64. In the case reported by HELFREICH, a girl of five fell on her head while "skipping rope." This was followed by fever and difficulty of speech. She was found eight days after the accident to be perfectly deaf and apparently suffering from aphasia, and had vertigo. The deafness remains, though her general health is restored. SWAN M. BURNETT.

NOSE AND NASO-PHARYNX.

65. PAWLOWSKY. Upon the treatment of rhinoscleroma with rhinosclerin. *Deutsch. med. Wochenschr.*, No. 14, 1894.

66. MOURE, G. J. Upon a case of spontaneously developed rhinoliths. *Monatsschr. f. Ohrenheilk.*, Nos. 8, 9, 1894.

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82. VULPIUS, W. Massage of the turbinated bodies. *Arch. f. Ohrenheilk.*, vol. xxxvi., p. 207.

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108. ASCH, MORRIS J. Endothelioma of the tonsil. *New York Eye and Ear Infirmary Reports*, vol. ii., p. 1, Jan., 1894.

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65. After making some preliminary researches, both in the laboratory and upon animals, PAWLOWSKY has gone a step further and has treated patients affected with rhinoscleroma by injecting into them subcutaneously a fluid of an extremely complicated composition. This latter contains the toxines of the bacilli of rhinoscleroma in the form of an aqueous-alcoholic glycerin extract. Afterwards the author employed a fluid consisting of the inspissated cold filtrates, together with the watery glycerin extract made from the bacilli, without the alcoholic and ethereal extracts,

and gave this fluid the name of rhinosclerin. The patients reacted to these injections in much the same way as do those who are treated with Koch's tuberculin, *i. e.*, they had chills, rise of temperature, acceleration of pulse and respiration, and especially severe pain in the affected parts of the face. The result of this method of treatment was that "under the influence of rhinosclerin the progressive development of this horrible and incurable disease had in the patients thus treated made no advance for almost two years, and that hence the neighboring tissues must be regarded as having been rendered immune." NOLTENIUS.

66. The calculus in MOURE'S case was most minutely examined, both chemically and histologically, by Sabrazès. It consisted of a mixture of bloody detritus and rings of calcium and magnesium phosphate. In the detritus were found granular and fibrillated fibrin, blood-pigment corpuscles, hæmatoidin crystals, and numerous colonies of bacteria. All the canals which traversed the calculus and even the fissures between the successive laminæ of phosphates contained micro-organisms, by which Moure believes the deposition of the calcium salts was caused. KILLIAN.

67. DIDSBURG has observed one case of rhinoliths himself. He distinguishes rhinoliths into false and true, according as they do or do not contain a nucleus consisting of a foreign body upon which the lime salts are deposited. Reasoning from a pathological standpoint, the author accepts the theory of a primary affection of the mucous membrane, which leads to the successive deposition of lime salts. In all the author has examined four cases, two of which, not before published, occurred in Luc's practice and his own.

68. HERZFELD, in order to remove from the naso-pharynx a hard rubber tube, 4.5 *cm* long and 0.5 *cm* thick, had to employ narcosis with a dependent position of the head. He also mentions a case of erysipelas in the mucous membrane of the septum, resulting in the formation of an abscess on both sides of the latter. There was no history of preceding injury. KILLIAN.

69. The rhinolith found by KEIPER in a man, aged 35, was crushed with a heavy duckbill forceps; some fragments were brought out anteriorly, the remainder was shoved into the pharynx and coughed out through the mouth. It was $\frac{3}{4}$ inch long, $\frac{1}{2}$ inch wide, nearly $\frac{1}{2}$ inch thick, and contained in its centre a cherry-stone, which must have been placed into the nose in childhood.

M. TOEPLITZ.

70. WAKEFIELD reports the case of a man, aged thirty-three, who exhibited purulent discharge from the left nostril and the formation of large polypi, which were expelled every four weeks. The nucleus of a foreign body proved to be a cherry-stone lodging in the nose since early childhood, where its retention was facilitated by a deepening in the floor. M. TOEPLITZ.

71. KJELMANN reports the following cases: 1. A twelve-year-old boy, otherwise healthy and with no family tendency to nervous disease, became affected in 1886 with tonic spasms, sometimes with, sometimes without, disturbance of consciousness. These gradually became more frequent, increased in violence, and from being present at first only at night afterwards began to occur in daytime also. In December, 1888, the inferior turbinated bodies, upon which there was a soft hypertrophy of moderate size, was cauterized. The patient remained well up to August, 1889, then a relapse occurred in connection with an acute coryza. Then, after the inferior turbinateds, which had again become greatly swollen, had been once more cauterized, the patient got well and remained so permanently—at least till 1892. Kjelmann assumes with Hack that by the swelling an irritation of the trigeminus is set up which being transmitted to the motor centres of the cerebral cortex, causes a discharge producing the spasm. 2. In the second case there were severe attacks of epilepsy with loss of consciousness, and chronic spasm. In the patient, a child of six, there was found a moderately-sized, soft, diffuse swelling of the right inferior turbinated. Here apparently the attacks could not be regarded as a reflex from irritation of trigeminus, since they persisted in spite of cauterization of the swollen turbinated, but stopped entirely as soon as the boy was broken of the habit, that he had kept up for three years, of interfering with his breathing through the nose by inserting his fingers in the latter during sleep. This case of epileptiform convulsions in all probability arose from the interference with breathing through the nose.

72. ZIEM, upon the basis of his experience of fifteen years as both a rhinologist and ophthalmologist, gives a very interesting general view of those eye diseases that may stand in causal connection to diseases of the nose. In affections of the laryngeal passages, conjunctiva, cornea, uveal tract, optic nerve, lens, orbit, lids, and lid-muscles, and also in tenonitis and in myopia, nasal affections of the most various nature were found. Among these suppuration of the accessory cavities played a particularly great

part. In numerous cases treated in vain by ophthalmologists, Ziem has effected an improvement and a cure by treating the nose. "In ten years," he says, "no one will be able to carry on the practice of ophthalmology unless he pays careful and constant attention to diseases of the nose." KILLIAN.

73. LEWIS'S first case, a man, aged fifty, was cured of his neuralgic pain and headache by Adam's operation for deviation of septum and the use of cork splints for support after operation, which resulted in a small perforation of the septum from bruising. Case II., a female, aged thirty-two, was greatly relieved from asthma by removal of the anterior extremity of the middle turbinated. M. TOEPLITZ.

74. LEDERMANN, although believing asthma to be due to disturbance of the sympathetic nerves, thinks that its occurrence is considerably influenced by nasal irritation. He illustrates this by two cases, which were promptly cured or greatly relieved by the removal of ecchondromata of the nasal septum.

M. TOEPLITZ.

75. In this case the supporting plate for the depressed nose was made of gold, and Mr. ELLISON thinks that his success was largely due to the fact that he took the precaution of having the plate perforated. The patient has been wearing the plate for seven years without inconvenience. The improvement, as seen in the photographs, was most marked. U. PRITCHARD.

76. BOUFFÉ gives two cases (in which, however, the cause of the stenosis is not mentioned) which were cured by rapid, progressive dilatation with bougies. The duration of treatment was three months and four and a half months respectively, and examination made respectively one and two years afterward showed that the cure still persisted.

77. BERENS avoids the evils connected with the use of the different septal supports after Adams's operation by preparing splints of corks of the pint-bottle size, which are whittled to the shape of an almond with the point cut off, and flattened on the side that is to lie against the septum; the opposite side, near its lower border, is slightly grooved for the reception of the inferior turbinated body. The splints are hollowed by a nasal burr, trephine, file, or red-hot metal, and coated with iodoformed collodium. Berens reports four cases operated by him or Dr. Hubbard, in which the splints were successfully used. M. TOEPLITZ.

78. SCHEPPEGRELL'S patient, a girl aged sixteen, had frequently

suffered from laryngitis and bronchitis, on two occasions from otitis purulenta dextra, and exhibited a marked nasal twang in the voice. The right nostril ended in a wedge-shaped funnel, "the obstruction being due to a welding together of the posterior end of the turbinals and the vomer into one bony mass." The first opening made with an electric burr and trephine was again occluded in three weeks, but the second opening, made by trephining two separate holes above and below, and removing the intervening piece of bone with the nasal saw, remained permanent.

M. TOEPLITZ.

79. LACOARRET relates a case in which, as the result of a blow from a dinner plate, fluctuant tumors covered with normal mucous membrane had formed upon both sides of the septum, and had blocked up the nose. Palpations of one produced no fluctuation in the tumor of the other side. Puncture afforded a pale, rose-colored, clear liquid. The sound did not strike any bare or thickened cartilage. Cure. The author considers the differential diagnosis, and opposes the views of Strazza, who has regarded an analogous case as one of lymphatic tumor. This latter diagnosis should have been confirmed by a precise examination of the fluid evacuated by puncture; if this had been done, it would have probably turned out, as in the case published by the author, that what was present was simply blood altered by processes of resorption.

ZIMMERMANN.

80. GARNAULT in this work speaks very enthusiastically upon the results of massage. He effects this by various instruments, among others by a vibrator of his own invention, which is run by a dynamo contained in the instrument itself and which is capable of affording both axial and transverse vibrations. He has also devised a special instrument for performing massage of the drum-membrane and ossicles. He often reinforces the action of the instruments by connecting them with the pole of a galvanic or faradic battery, the other pole being connected with an indifferent spot. He regards it as absolutely essential that the vibrations produced should be absolutely uniform and regular. Their number usually varies from 350 to 400 a minute. The sound by which the massage is performed is also used as a means of making at the same time medicinal applications to the mucous membrane (*e. g.*, of corrosive sublimate, balsam of Peru, and iodo-glycerine); but such applications the author regards as simply auxiliaries to the massage treatment and not, as others have done, the essen-

tial part of it. He reports particularly favorable results in ozæna, acute coryza, chronic nasal catarrh, and reflex nasal neuroses, and in diffuse and granular chronic pharyngitis; but seems to regard it as efficacious in almost all the diseases of the nose and throat, and believes that in the acute exanthemata he can by this means prevent the development of an otitis media and that in catarrhal otitis media itself he can secure the disappearance of the exudate and in the sclerosing form the abolition of the tinnitus.

ZARNIKO.

81. BOGDAN recommends massage of the mucous membranes, having been himself cured under Laker's hands of a chronic pharnygeal catarrh and a tumescent catarrh of the nose by this means. POLLAK.

82. VULPIUS has had no success with massage in ozæna as performed by Braun and Laker, and considers the action pretty much the same as that of Gottstein's tampon, *i. e.*, regards it as depending upon irritation of the surface of the mucous membrane. On the other hand, Vulpius used with advantage, in diffuse swellings of the mucous membrane, the sound which he has proposed and which is broad anteriorly. With this instrument he does a sort of massage accomplished by a stroking movement from before backward, and attempts in this way to empty the blood that distends the turbinated bodies into the plexus of the pharyngeal vein and at the same time to turn the lymph current in the same direction. The massage is performed at first at intervals of two days, afterwards less often. Cocaine is usually not required.

RUMLER.

83. BISHOP believes the prevalence of paroxysms of hay-fever during the early morning hours to be due to the excess of uric acid, the blood reaching its point of greatest alkalinity at about nine o'clock A.M. He therefore institutes anti-uric-acid treatment with mineral acids, preferring the dilute sulphuric acid and acid phosphate of sodium. He recommends also for preventive treatment small doses of salicylate of sodium, beginning forty days prior to the expected attacks, and lithia water. The last part of the valuable paper is taken up by the views of the different authorities on hay-fever. Bishop also applies the galvano-cautery, when there are positive local indications for its use.

M. TOEPLITZ.

84. WRIGHT says that the nose cannot be cleansed in a surgically aseptic sense on account of the intricate structure of the

nasal cavities and their accessory sinuses and that of the naso-pharynx, in which pyogenic and other pathogenic bacteria are always found. The nasal mucous membrane, however, seems to possess considerable power of resistance against infection; septicæmia after intranasal procedures is, therefore, of very rare occurrence. Notwithstanding these facts it is prudent to cleanse the nose with alkaline antiseptic washes applied anteriorly with compressed air and posteriorly with the post-nasal syringe; the mouth and oro-pharynx are cleansed by sprays of peroxide of hydrogen (1:3) or gargles of solution of sublimate (1:5000). The number of germs is thus diminished. Wright prefers the irrigations to be subsequent rather than preliminary to operations.

M. TOEPLITZ.

85. In MEYERSON'S case the cyst was as large as a pigeon's egg, filled with pus, and completely blocked up the nose, reaching to the floor of the nasal cavity. There were also empyema of the maxillary sinus and nasal polypi. KILLIAN.

86. In DREYFUS'S case there was a discharge of fetid pus from the nose, and an exploratory puncture made at the anterior extremity of the inferior turbinated brought away a syringeful of pus. To determine the existence of an empyema of Highmore's antrum, Dreyfus extracted the stump of the second premolar tooth and its alveolus, and opened into the maxillary sinus, which, however, turned out to be healthy. An argument in favor of the diagnosis given in the caption was the swelling at the inner angle of the eye, combined with the marked erysipelatous swelling at the skin. A cure occurred three months later after repeated cauterizations of the inferior turbinated. POLLAK.

87. According to HAJEK'S observations there is no constant condition found that will serve for the diagnosis of ethmoidal disease. With the exception of cases in which there are osseous cysts of the middle turbinated and in which rupture into the orbit with the formation of fistulæ takes place, the diagnosis is uncertain. The only constant change which Hajek has found is the presence of polypi or hypertrophies in the middle meatus. But the diagnosis of empyema of the ethmoidal cells is justified only by catheterization of the ethmoidal labyrinth—which itself is possible only after removal of the middle turbinated bone and exposure of the ethmoidal aperture—and by the increase in the flow of pus produced by this operation. The necrosing form of ethmoiditis is, according to Hajek, very rare. He further combats

the view that nasal polypi are always the result of an affection of an accessory sinus. That, on the contrary, polypi often furnish the cause for the development of such an affection, Hajek considers probable. He opposes the idea of Grünwald and Bresgen, that typical atrophic fetid rhinitis is probably always referable to disease of one of the accessory curities; his opposition being based upon the results of Zuckerkandl's autopsies and his own experience, inasmuch as after accurately examining many cases of typical ozæna he has only once succeeded in demonstrating an empyema (in this case affecting one of the maxillary sinuses). POLLAK.

88. BURGER has observed two cases in which along with an empyema of the maxillary antrum of one side there were on the back part of the nasal fossa on the other side a chronic inflammation and an accumulation of purulent debris. He explains the connection by supposing that, as the patient lay upon the healthy side at night, the pus flowed from the maxillary sinus upon the septum and along this into the other nasal fossa, which was originally healthy. Burger has, moreover, made the noteworthy observation that, in transillumination of the maxillary sinuses of healthy subjects, it was always stated that there was a sensation of light, while in the cases in which the antrum was diseased this sensation was absent on the affected side. KILLIAN.

89. LUC, as the result of several operations which have caused him to modify his previous method of operating, believes that he may now formulate the following rules. Since empyema of the maxillary sinus and the ethmoid cells may exist along with empyema of the frontal sinus, we should in disease of the latter always examine the maxillary sinus with the electric light and always follow up the opening of the frontal sinus with opening into the ethmoid cells. Exploration of the frontal sinus by means of an electric lamp inserted into the orbit has a diagnostic value only when it gives a positive result. In opening the frontal sinus we should, in order to get a really radical cure, expose its anterior wall as fully as possible: in all cases this should be followed by opening of the ethmoid cells, and at the same time a free passage into the nose should be made by means of a thick drainage-tube. The disfigurement may be reduced to a minimum by primary suture of the external wound.

90. In EULENSTEIN'S case the point of a trocar broke off during the operation of boring into the maxillary antrum through the alveolus, and got into the antrum. Four months afterwards,

having in the meantime passed the ostium maxillare, it came out of the nose, while the latter was being irrigated. KILLIAN.

91. LIEBE believes that in his case the pus had broken through to the pharynx. But probably in this case, as in one observed by the Reviewer, what was really present was a metastatic abscess in the pharynx. KILLIAN.

92. WINKLER describes the way which he adopted in order to open into the frontal sinus from the nose. A puncture made on the external aspect of the middle turbinated, he considers as admissible in only a few cases, which he particularizes ; in others it is contra-indicated on account of the danger of opening into the orbit. On the other hand, he ranges himself among the warm adherents of Schaffer's method of puncturing the frontal sinus, which is performed by means of a sound 2 *mm* thick introduced on the internal aspect of the anterior extremity of the middle turbinated. Upon the basis of anatomical studies and experiments upon the cadavers, he demonstrates that this procedure is more frequently applicable than the other way, and he gives precise directions enabling one to operate by this method upon the living subject without danger. If his directions are followed, he considers this method to be as free from danger as is the simple application of a sound to any of the natural orifices. Nevertheless we are convinced that not very many others will follow him in this extraordinary way. KILLIAN.

93. ADAMS'S and NICHOLS'S patient, a girl æt. twenty, first noticed in 1888 some nasal obstruction, which gradually increased, with discharge and odor. Two years later, she suffered from frontal headache, and an aggravating dry cough, weakness of the eyes, and full feeling of the orbit. The eyes began to protrude and in April, 1890, an abscess developed under the right upper lid which was opened at the outer edge of the orbit, followed by another abscess, leaving a fistula and causing total blindness of the right eye after the development of corneal ulcer and leucoma. In March, 1892, abscesses developed over the left eye, leaving also a fistula but without affecting the eyesight. Dead bone could be felt through the fistulæ and also through the nose after removal of enormous masses of polypi. The patient, however, died from pneumonia before an attempt at a radical evacuation of the frontal sinuses was made. The autopsy revealed complete destruction of the orbital wall of the frontal sinuses and ethmoidal cells.

M. TOEPLITZ.

94. In ONODI's case, a man fifty years of age, who had already had operations for numerous nasal polypi performed on both sides of the nose, the polypi recurred on the right side, together with suspicious granular new growths, which, upon histological examination, turned out to be round-celled sarcomata. Both were removed and their points of origin burned with the galvano-cautery. Then for two years the patient was entirely well, but afterwards there was a recurrence, and in the course of the fifth year a radical surgical operation had to be performed on account of the rapid growth of the tumor. The sarcoma, which sprang from the middle turbinated, filled the whole of that side of the nose, and with it was associated an empyema of the lachrymal sac and of the frontal, ethmoidal, and sphenoidal sinuses. The operation, made about half a year ago, was successful. ZIMMERMANN.

95. SENDZIAK, in the case of a workman, aged fifty-three, removed, through the mouth, a naso-pharyngeal tumor, using the cold snare for the purpose. The tumor, which was 6 *cm* long, 5 broad, and 2½ thick, was pale, soft, lobulated, and brain-like in appearance, and upon microscopical examination was shown to be a papilloma, into which two soft, fibromatous nodules had penetrated. KILLIAN.

96. In removing fibrous naso-pharyngeal polypi, ANNANDALE advocates the use of chloroform as an anæsthetic, places the head in a dependent position, divides the soft palate in the median line, and, pulling aside the two halves, rapidly separates the tumor from its connections and twists it off with a forceps.

U. PRITCHARD.

97. CHIARI's treatment consists in almost every case in removing the adenoid vegetations with the cold-wire snare, introduced through the nose, controlling his operation at the same time by means of posterior rhinoscopy. POLLAK.

98. The remarkable features of MCKERNON's case, which occurred in a girl, aged nine, consisted in the rapid growth of adenoids within seven months from a small swelling to a firm growth, extending below the soft palate, and in the occurrence of torticollis twenty hours after operation, which, however, completely disappeared in a week. M. TOEPLITZ.

99. KNIGHT, after reviewing the literature on nasal reflexes, and particularly those of the naso-pharynx, discusses, on account of the fully reported case of McKernon (*cf.* above), the reflex phenomenon of torticollis. From the extensive study of the

anatomical relations, he agreed with J. N. Mackenzie as to the intimate relation of the reflex phenomena to disturbances of the sympathetic nerves, and he concludes that the torticollis was produced by a lesion of nerve filaments in the mucous membrane, resulting in a reflex irritation of the muscular fibres engaged in rotation of the head. The disturbance may be avoided by a relatively superficial use of instruments upon the posterior pharyngeal wall, and preliminary ploughing up the adenoid tissue of that region with the finger before operating. The posterior wall seems to be the site of origin of the motor disturbances.

M. TOEPLITZ.

100. Adenoids in young infants are of much more frequent occurrence than is generally recognized, and they are frequently found in connection with purulent otitis. ROBERTS reports four cases which have occurred in children under two years of age, the youngest being not quite four months old. He prefers to operate without ether and with Hooper's forceps.

M. TOEPLITZ.

101. In WENDELL PHILIPPS's patient, a woman, aged seventy-one, wide bands of connective tissue were seen passing from the upper borders of the Eustachian orifices to the body of the sphenoid bone, each terminating in a small mass of adenoids. The Eustachian tubes were drawn upwards and medially. The bands of both sides formed an arch and were the result of adenoids. They influenced the hearing and were removed by a curved galvano-cautery electrode with flat protector made of bone.

M. TOEPLITZ.

102. According to BERG, there are two varieties of retropharyngeal abscess, namely, the chronic or cold abscesses, due to Pott's disease, and the acute abscesses, resulting from suppuration of the soft tissues behind and around the pharynx. The former occurs more frequently in adults, the acute form in very young children. Another form of retropharyngeal abscess results from impaction of foreign bodies in the posterior wall of the pharynx. The chronic abscesses due to Pott's disease lie underneath the anterior common ligament of the vertebral column, or at least beneath its external layer, and, in addition, below the so-called prevertebral fascia, and, when breaking through the former, appear in the posterior triangle of the neck and even in the axilla. For this form an external incision is, therefore, indicated. All other forms are situated behind the muscular wall of

the pharynx and in front of the prevertebral fascia and should be opened from the mouth. The remainder of the paper is taken up with the symptomatology and differential diagnosis.

M. TOEPLITZ.

103. In LEDERMANN'S case, the enormous tonsils, from which the patient, a young man, aged twenty-one, had had repeated attacks follicular angina, left a chink of not over $\frac{1}{4}''$ in width between each other, the larger left one pushing the uvula to the right. Five days after their removal with the galvano-cautery snare two hemorrhages from the left tonsil, lasting five and four hours respectively, with an interval of two hours between, were each time controlled by a spray of cocaine, of four per cent. Simultaneous excruciating pain in the left ear, with signs of aural inflammation, was probably due to the exposure of some filament of the glosso-pharyngeal nerve. M. TOEPLITZ.

104. This paper of DE SANTI'S contains a careful comparison of the evidence, from which the author concludes that hemorrhage following tonsillotomy is so rare that "tonsillotomy is nearly always a safe and satisfactory operation," but that in all cases we should be prepared to deal thoroughly with hemorrhage.

U. PRITCHARD.

105. ROOS communicates several cases of a special variety of angina which is sometimes the precursor of acute articular rheumatism.

"Rheumatic angina appears to differ from all other affections of the throat, whether of a follicular, diphtheritic, or catarrhal nature. From the observations so far made, its chief characteristics may be stated to be marked pain in swallowing; redness and swelling of the pharyngeal mucous membrane; usually swelling of one or both tonsils, with or without subsequent suppuration; the absence of any coating of pus upon the tonsils or the presence of only a very slight, diffuse purulent layer; and the comparatively protracted duration of the trouble." RUMLER.

106. MAYER, after reviewing the literature of the subject and particularly dwelling upon the views of Michel and Stoerk, agrees with the latter that the galvano-cautery is of value in coalescent hypertrophies of the pharynx. For the treatment, however, of hypertrophies scattered over the whole posterior wall, he prefers curetting, which he at first performed with the modified Gottstein curette, but afterwards with an instrument of his own device. This consists of a stapes-shaped ring-knife measuring half an inch in its greatest width. Two metallic bars ending in a shaft and

handle are attached to the centre of the limbs of the ring-knife. Mayer quotes one case at length as an illustration, and appends a table of twenty cases operated with his instrument. He concludes therefrom that the entire wall may be curetted at one sitting, without danger and without subsequent cicatrization, and with speedy recovery. M. TOEPLITZ.

107. BRICKLEY reports a case of lupus vulgaris in a man, aged thirty-three, in whom he found the uvula divided by a ragged ulcer, the posterior pillars much indurated and ulcerated, exhibiting all stages of ulceration and cicatrization, the posterior pharyngeal wall covered with stellate cicatrices, and an ulcer near the left Eustachian tube, and the pharyngeal vault covered with infiltrated and broken-down tissue. Curetting and lactic acid improved the condition of the pharynx and that of the left ala nasi, which was affected suddenly during the treatment of the pharynx.

M. TOEPLITZ.

108. In ASCH'S case, a woman, aged thirty-five, the growth, which produced no inconvenience, filled the right half arch completely, extending to the uvula and base of the tongue. It was flattened on its anterior surface, slightly nodular, red, and bleeding readily when touched. It proved, after removal with Knight's galvanic tonsillotome, to be an endothelioma. Another small recurring tumor was removed a month later. This is the first case of endothelioma of the tonsil on record. Prognosis unfavorable. M. TOEPLITZ.

109. In CLEVELAND'S case the growth developing in a man aged sixty-five, with hereditary taint of malignancy, tumor, involved the entire uvula, extended upward on the soft palate and on either side well across the half arches. It was dense and superficially ulcerated. It proved to be an epithelioma and was removed successfully under cocaine with the galvano-cautery knife and the smallest point of the Paquelin cautery.

M. TOEPLITZ.

MISCELLANEOUS NOTES.

A.—BRITISH NEWS.

APPOINTMENTS.

FULLARTON, Dr., has been appointed Visiting Surgeon for the Treatment of Diseases of the Throat, Nose, and Ear at the Greenock Eye Infirmary.

HILL, G. W., M.D., B.Sc. (Lond.), has been appointed Surgeon in charge of the Aural Out-patient Department at St. Mary's Hospital.

HOLLOWAY, M.D., B.A. (Cantab.), M.R.C.S., has been appointed Assistant Surgeon to the Central London Throat and Ear Hospital, Gray's Inn Road.

SOCIETIES.

ROYAL ACADEMY OF MEDICINE IN IRELAND—Section of Surgery.—At the meeting held on May 4, 1894, Mr. Woods read a paper on *Naso-Pharyngeal Fibroma*, relating a case in which he had used with advantage a "galvanic curette," removing the growth piecemeal and at consecutive sittings.

BRITISH MEDICAL ASSOCIATION—Midland, Cambridgeshire, and Huntingdonshire Branch.—At the meeting held on June 21, 1894, Mr. W. Gifford Nash, of Bedford, gave particulars of a case of subdural abscess and septic thrombosis of the lateral sinus following otitis media. The operation performed by Mr. Nash had been in every way successful.

South Midland Branch.—At the meeting held at Peterborough

on October 4, 1894, Dr. A. C. Hartley of Bedford read notes of a case of double abscess of the mastoid cells in a child of thirteen months. The exciting cause of the first abscess, on the left side, appears to have been exposure to cold; the abscess on the right side appeared about a fortnight after. Both abscesses were freely incised, and a considerable quantity of pus escaped; the child did well.

North of England and Border Counties Branches.—At the meeting held on October 30, 1894, Dr. Robertson exhibited diseased ossicles from the middle ear, with instruments used in removing them.

South-Eastern Branch—West Kent District.—At the meeting held on October 26, 1894, Mr. St. G. C. Reid read a paper on *Tinnitus Aurium*, and Dr. J. Dundas Grant read a paper on *Diseases of the Antrum of Highmore*, demonstrating the methods of aspirating.

Kidderminster Medical Association.—At the meeting held on June 29, 1894, Mr. J. L. Stretton showed a child aged two and one half years from whose external auditory meatus he had removed a small portion of necrosed bone.

Edinburgh Medico-Chirurgical Society.—At the meeting held on July 4, 1894, Mr. Miller showed a case in which he had recently operated for subdural abscess and septic thrombosis of the lateral sinus following middle-ear disease.

British Laryngological and Rhinological Association.—At the meeting held on July 13, 1894, among other important matters discussed were the following, viz.: Dr. A. Sandford read the notes of a case in which death from convulsions had taken place about six hours after the removal of adenoid growths from the post-nasal space by the scraping operation under cocaine.

Dr. Norris Wolfenden, in opening the discussion on follicular tonsillitis, dwelt on the difficulty of diagnosing this complaint from diphtheria by means of clinical evidence alone.

Leeds and West Riding Medico-Chirurgical Society.—At the meeting held on November 2, 1894, Mr. Secker Walker showed a patient upon whom he had recently operated for double mastoid abscess, with septic thrombosis of the left lateral sinus, following double otorrhœa. On the right side the mastoid cells only were cleared out, the sinus not being affected.

LIVERPOOL MEDICAL INSTITUTION.—At the meeting on October 18, 1894, Mr. Murray showed three cases in which he had successfully operated for cerebral abscess. In two of these the condition was the result of middle-ear disease. In one of these latter the abscess was in the temporo-sphenoidal lobe, and contained about three ounces and a half of pus; the second case was somewhat remarkable; three operations were performed before the seat of the lesion was finally discovered, when five or six ounces of pus were removed from an abscess cavity in the cerebellum; the patient made an excellent recovery, and with the others was shown at the meeting. Cases of recovery from cerebellar abscess are not very common, and Mr. Murray is to be congratulated upon his perseverance and skill.

SHEFFIELD MEDICO-CHIRURGICAL SOCIETY.—At the meeting held on November 8, 1894, Mr. Pye-Smith read a paper on *Antrectomy for Persistent Suppuration of the Middle Ear and its Complications.* He showed four cases and gave the results of five others.

We would remind our English readers that the Elementary Education Act, 1893 (Blind and Deaf Children), is now in operation. By the terms of this Act the educational authorities for the respective districts, *i. e.*, the School Boards and School Attendance Committees, are bound to provide suitable and special accommodation for the education of the afflicted children within their area; in lieu of such accommodation being specially provided, the authority is empowered, on payment, to send the children to any approved blind or deaf institution, and provision is made for boarding out children coming from a distance. On the other hand, the fact of a child being blind or deaf will no longer be held sufficient excuse for its non-attendance at a suitable school. In some districts steps have already been taken for carrying out the provisions of this act, but in other districts, no doubt, attempts will be made to evade it, not only because it entails extra trouble to the School Attendance Committees, but also because many parents will object to the application of the "boarding-out" clauses. There is no necessity to point out to how great an extent the proper working of this act is dependent upon the active co-operation of medical men in general and of aural surgeons in particular. An act upon similar lines is also in force in Scotland.

To provide for the increasing accommodation required, it has been decided to erect a new building on the site of the Eye, Ear, and Throat Hospital at Cork. The cost has been estimated at £5,000, and towards this sum an anonymous donor has contributed £1,000, and Dr. Sandford, the ophthalmic surgeon, £250.

The ninth annual report of the Manchester Ear Institution shows an increase in the number of patients treated during the past year of 89. The system of special subscribers, letters, or recommendations had been abolished, and a charge of fourpence per visit substituted.

B.—REVIEWS OF BOOKS.

I.—Prof. Dr. MORITZ SCHMIDT (*Die Erkrankungen der oberen Luftwege*). **Diseases of the Upper Air Passages.** Berlin, 1894. Reviewed by AD. BARTH, Marburg.

The author does not call his work a "text-book," but prefaces it more modestly with the motto: "From practice for practice." He prefers to arrange the material in an entirely different manner from the usual plan of text-books. He discusses conjointly the separate forms of diseases of the nose, pharynx, and larynx, and, where it seems requisite, of the lungs as well, and also the symptoms which the entire organism may exhibit simultaneously, thus giving harmonious pictures which fascinate the reader and are more readily committed to memory than the traditional descriptions of most text-books. On the other hand, it is true that by this arrangement some chapters are very loosely connected with the whole. Even the motto could not always be strictly followed, inasmuch as the author, unless large gaps were left, had to discuss some subjects with which he was but slightly or nor at all familiar. Anatomy and physiology are treated in the first chapters with sufficient elaborateness for the practitioner. We emphasize the third chapter on "General Considerations." It contains for the physician an abundance of valuable suggestions, such as are in vain looked for in text-books. Some chapters, for which the author did not consider himself to be sufficient authority, were supplied by friends, in particular, neurology by Edinger and musical questions by Stockhausen. For the methods of examinations, especially in the naso-pharynx, the main stress is justly laid upon the sight; palpation occupies only a subordinate place. A work which everywhere manifests the individuality of the author, cannot, of course, be agreed with in every detail. I shall mention but a few

particularly striking points. The author does not appear to be very much in favor of the use of cold for therapeutic purposes. The insoluble talc is recommended as constituent of powders for insufflation in catarrh, and also in the tuberculosis of the nose and larynx, although in other places inspiration of dusty air is warned against in these very affections. Reviewer has for years rejected these insoluble powders, using in their stead mostly biborate of soda. Potassium chlorate ought to be less recommended on account of its poisonous qualities. The causes which render the removal of the cannula after tracheotomy impossible, are not always to be looked for in its immediate neighborhood. Reviewer has observed a case in which the cannula could not be removed until after extremely hypertrophied faucial tonsils had been excised. The rejection of inhalations of pulverized fluids on page 398 contradicts their recommendation on page 400. The book, on the whole, is as suggestive as it is interesting, is supplied with many good illustrations in the text, and the appended plates are well gotten up by the publisher. It deserves the widest circulation.

T. M. Hovell. **Diseases of the Ear and Naso-Pharynx.** London, 1895.

In this handy volume Dr. Hovell has managed to condense considerable valuable material with regard to diseases of the ear and naso-pharynx. The book is in the main well arranged. It starts with quite a complete account of the anatomy and physiology of the sound-conducting apparatus (60 pages), followed by about 80 pages more upon history-taking, the various means of physical examination, and the various measures and appliances used in the treatment of ear disease. This part is clear, well-put, and practical, although as elsewhere in the book, possibly a little too much prominence is given to the author's pet devices and to apparatus of his own invention. We cannot altogether agree with the author in thinking that in employing politzerization with perforation of the membrana tympani "there is no risk of forcing secretion into the mastoid cells," nor should we be inclined to ascribe to the Valsalva method the high value that he gives to it. A method so liable to abuse, we think, should be used with extreme caution. Next follow a series of chapters upon diseases of the external ear and membrana tympani, which are quite full and satisfactory. We should, however, have liked to see a more complete and precise account of diffuse otitis

externa and particularly of the desquamative form, which, to be sure, is rarely treated of adequately. The succeeding chapter upon diseases of the naso-pharynx is too brief, but is good as far as it goes. It may be noted in passing that for removing adenoids the author prefers forceps to any form of curette. He also advocates the use of a general anæsthetic in these cases—certainly the safer and surer plan,—and gives rather minute directions for its safe administration. After a short chapter upon diseases of the Eustachian tube he takes up the affections of the middle ear, which naturally occupy a large space (about 225 pages). In spite of its fulness this part of the book is somewhat disappointing, particularly in the sections on treatment. This is especially true of the paragraphs upon the various intra-tympanic and extra-tympanic operations, the description of which is quite perfunctory. Even the directions for the various mastoid operations, though minute, read more like compilations than the authoritative statements of one writing from his own experience. Following the account of the middle-ear diseases is a chapter, which seems rather out of place, upon local and general affections liable to cause disorders of hearing ; and this again is succeeded by chapters upon injuries of the tympanum and upon otalgia. One hundred pages upon the anatomy and physiology of the internal ear (curiously enough without illustrations), and the etiology, diagnosis, symptomatology, and treatment of diseases of the sound-perceiving apparatus follow ; and some chapters on electricity, deaf-mutism, aids to hearing, and the legal aspects of aural diseases close the book. As a whole we can commend the latter both for its style, which, barring certain redundancies of expression, is excellent, and for its matter. The chief fault that we have to find is in the matter of omissions, and these are by no means so serious as to interfere with the usefulness of the work as a text-book, for which purpose it is well adapted. The mechanical execution and typography are excellent and materially enhance the availability of the book. A D.

C.—OBITUARY.

JOHANN CHRISTIAN ERDMANN LEMCKE, 1850–1894.

From a career full of labor, a very valuable member of our specialty has been torn away in the prime of life. Professor Lemcke died, not quite forty-four years old, at Rostock, September 11, 1894,

of cancer of the liver. After having been assistant to the Rostock Medical Clinic he studied diseases of the ear, nose, and throat at Vienna, settled in Rostock, 1885, was "privat-docent" until 1892, when he was appointed professor of otology and director of the Oto-Laryngological Clinic. He made an elaborate investigation into *The Deaf-Mutism in the Grand-Duchy of Mecklenburg-Schwerin*, wrote a good paper on *Hyperostosis of the Petrous Bone and its Relation to Otitic Brain Disease*, another *on Caries and Necrosis of the Petrous Bone after Influenza*, and published a scientific report on his clinic, which contains many valuable suggestions.

SZENES.

D.—APPOINTMENT.

DR. OTTO KÖRNER, well known by his anatomical studies and other investigations, especially by his excellent monograph (163 pages, 1894) on *The Otitic Diseases of the Brain, the Meninges, and the Sinuses*, has been appointed professor in the university and director of the Oto-Laryngological Clinic at Rostock, Germany.

Contents of the last Issue (Dec., 1894) of the German Edition of these Archives (*Zeitschrift für Ohrenheilkunde*, Nos. 2 and 3 of Vol. XXVI.)

A.—ORIGINALS:

1. A. HARTMANN, Historical Remarks on the Exposure of the Tympanic Attic and Mastoid Antrum. (Translated in the present number.)

2. H. LEVI, Serous Meningitis from Chronic Otitis. (To be translated.)

3. O. PES and G. GRADENIGO, Acute Otitis Media Caused by Bacillus Pyocyaneus. (To be translated.)

4. C. REINHARDT, Treatment of Cholesteatoma by a Permanent Retro-auricular Opening. (To be translated.)

5. G. GRADENIGO, Field and Acuteness of Hearing. (To be translated.)

6. A. BING, Report on the Section of Otology at the 66th Convention of the German Naturalists and Physicians in Vienna. (To be translated.)

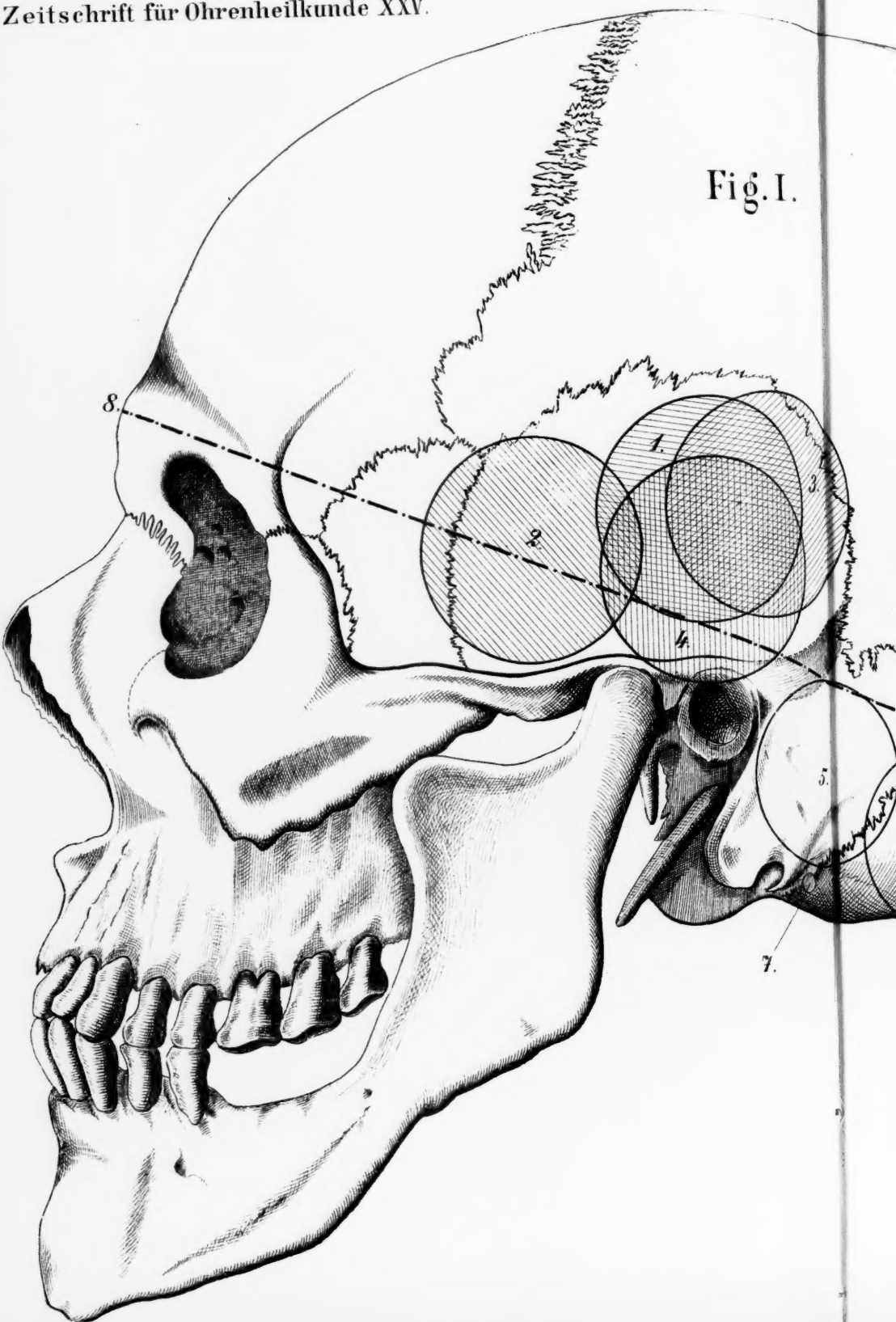
7. POLYAK, Report on the meeting of the Hungarian Otologists and Laryngologists, in Buda-Pest. (To be translated.)

8. BARTH, HARTMANN, and OTHERS, Systematic Report on the Progress of Otology and Rhinology during the First Half of the Year 1894. (Translated in the present number.)

9. MOOS, Report on the Third Meeting of the German Otological Society at Bonn. (Translated in the present number.)

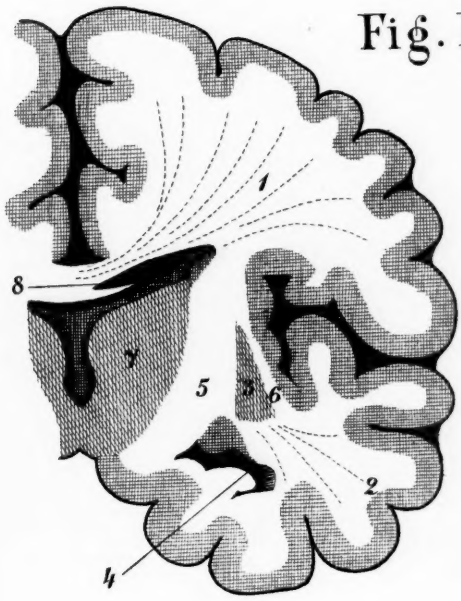
B.—TRANSLATIONS FROM THE ENGLISH EDITION.

Fig. I.



C. Krupf, lith.

Fig. II.



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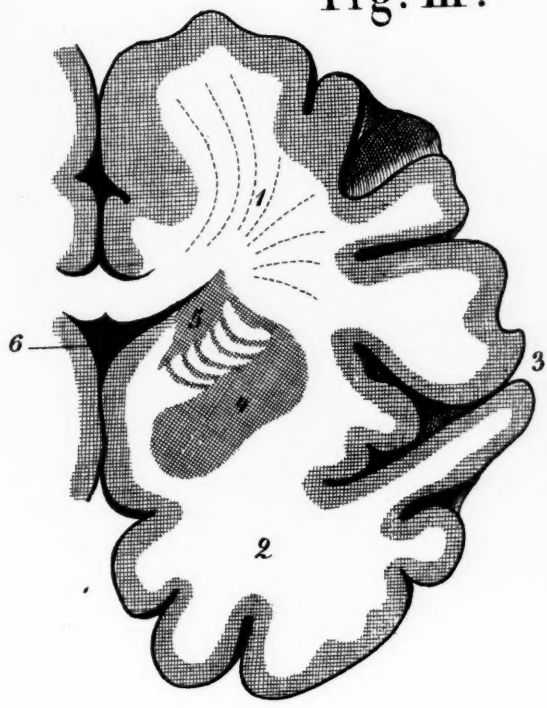

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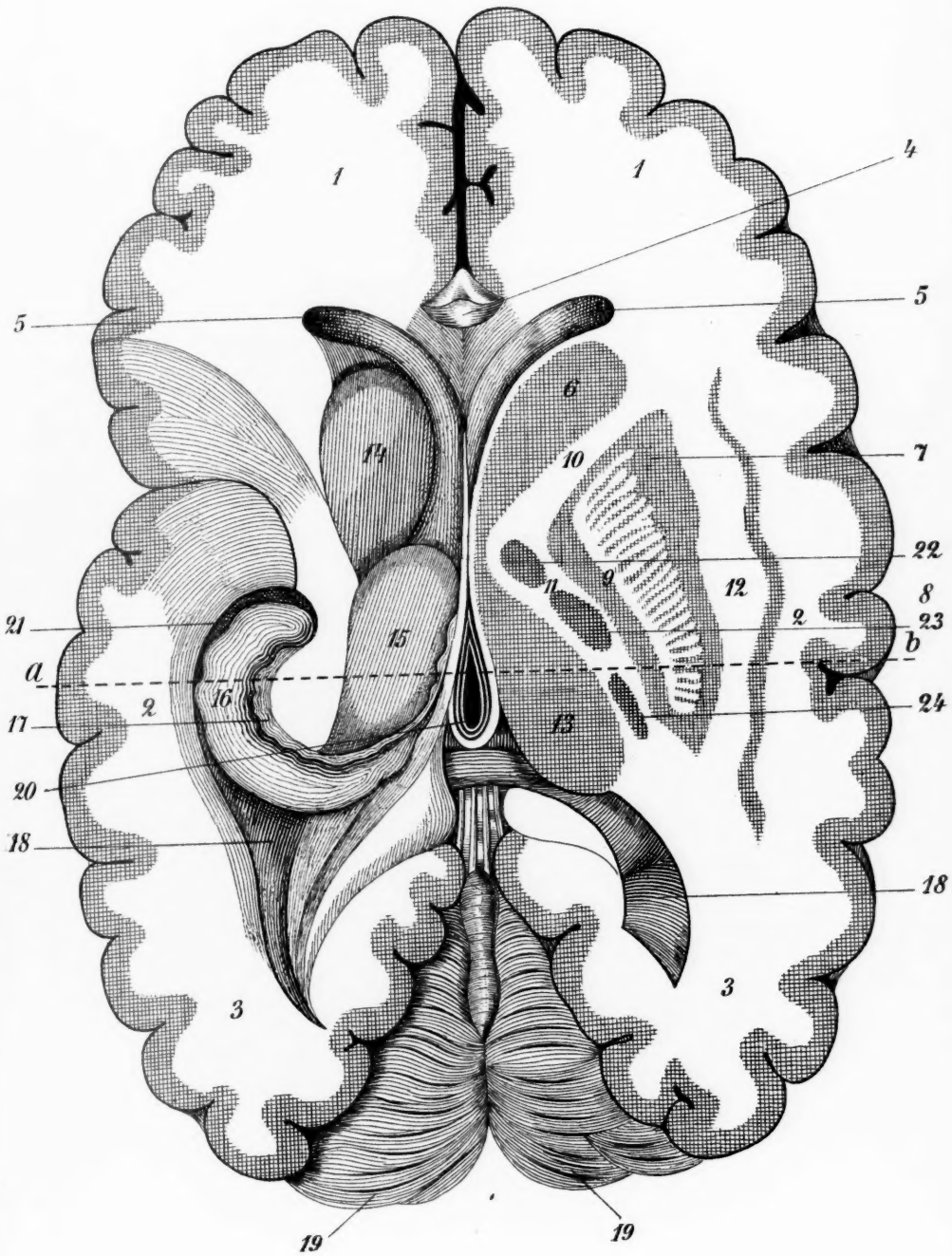

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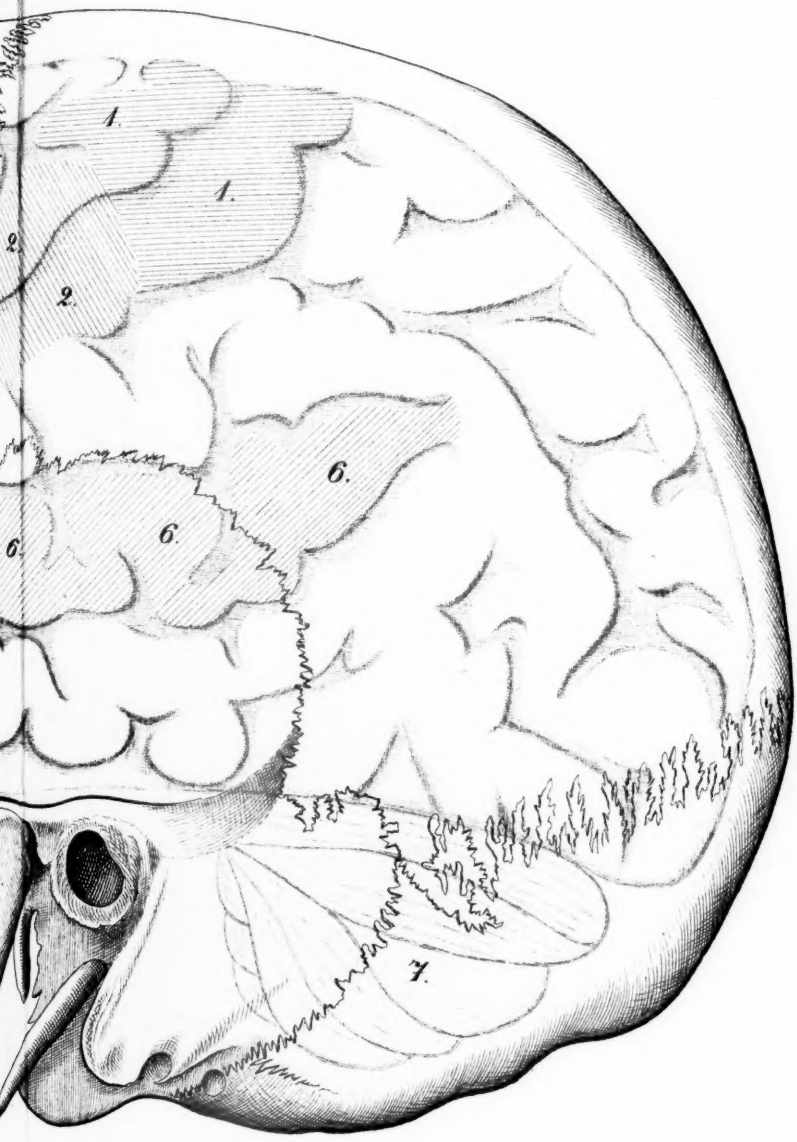

Fig. V.

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The editors and publishers of the ARCHIVES beg to offer some suggestions to authors who propose to favor them with their contributions.

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2. Authors will receive gratuitously twenty-five reprints of their articles. If a greater number is desired,—notice of which should be given at the head of the manuscript,—only the additional cost of presswork and paper will be charged to the author.

3. In preparing manuscript for the compositor it is requested that the following rules be adhered to:

a. Write on one side of the paper only.

b. Write without breaks, *i. e.* do not begin a new sentence on a new line. When you want to begin a new line or paragraph at a given word, place before it in your MS. the sign ¶.

c. Draw a line along the margin of such paragraphs as should be printed in smaller type—for instance, all that is clinical history in reports of cases, etc.

d. Words to be printed in *italics*, should be underscored once, in SMALL CAPITALS twice, in LARGE CAPITALS three times.

4. Authors may receive proofs for revision if they will kindly return them without delay. We beg however to remind our contributors that changes in the copy are equivalent to resetting, causing so much additional expense. We therefore request them, to make, if possible, no alterations at all in their MSS., or, at least, to limit these to what is of essential importance.

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II.—Anatomie normale et pathologique des fosses nasales et de leurs annexes pneumatiques. By E. Zuckerkandl. French translation by L. Lichtwitz and P. Garnault.

III.—The Year-Book of Treatment for 1895.

IV.—Diseases of the Ear. A Text-book for Practitioners and Students. By E. B. Dench, M.D.

V.—Diseases of the Ear. By Marmaduke Shield, F.R.C.S.

VI.—The Anatomy of the Nasal Cavity and its Accessory Sinuses. By Dr. Ónodi.

VII.—Précis des Maladies de l'Oreille. By P. Garnault.

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